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REPORT OF THE PROCEEDINGS

OF THE

INDIANA HORTICULTURAL SOCIETY

FOR THE YEAR 1905

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TRANSACTIONS

OF THE

Indiana Horticultural Society

FOR THE YEAR 1905.

BEING A

REPORT OF THE FORTY-FIFTH ANNUAL MEETING, HELD IN ROOMS 11-12, STATE HOUSE, INDIANAPOLIS, IND., DECEMBER 6-7, 1905, TOGETHER WITH THE REPORT OF THE SUMMER MEETING, HELD AT HENRYVILLE, CLARK CO., INDIANA, AUGUST 9-10, 1905, AND PROCEEDINGS OF THE STATE BOARD OF HORTICULTURE AND LOCAL SOCIETIES.

BY

W. B. FLICK,
SECRETARY.

TO THE GOVERNOR.

INDIANAPOLIS:
WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING.
1906.

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STATE OF INDIANA,
EXECUTIVE DEPARTMENT,
INDIANAPOLIS, February 10, 1906.

Received by the Governor, examined and referred to the Auditor of State for verification of the financial statement.

OFFICE OF AUDITOR OF STATE,
INDIANAPOLIS, March 5, 1906.

The within report, so far as the same relates to moneys drawn from the State Treasury, has been examined and found correct.

WARREN BIGLER,
Auditor of State.

MARCH 6, 1906.

Returned by the Auditor of State, with above certificate, and transmitted to Secretary of State for publication, upon the order of the Board of Commissioners of Public Printing and Binding.

FRED L. GEMMER,
Secretary to the Governor.

Filed in the office of the Secretary of State of the State of Indiana, March 6, 1906.

DANIEL E. STORMS,
Secretary of State.

Received the within report and delivered to the printer this 6th day of March, 1906.

HARRY SLOUGH,
Clerk Printing Bureau.

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LETTER OF TRANSMITTAL.

To His Excellency, Hon. J. Frank Hanly,
Governor of Indiana:

SIR—In accordance with the requirements of the law, I have the honor to herewith present you the forty-fifth annual volume of the transactions of the Indiana Horticultural Society, together with such other papers as seem to be appropriate for publication in this connection.

Respectfully,

W. B. FLICK,
Secretary.

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OFFICERS OF THE SOCIETY FOR 1905-1906.

President .....H. H. SWAIM.....South Bend.
Vice-President .....W. C. REED .....Vincennes.
Treasurer .....SAMUEL A. HAZELETT.....Greencastle.
Secretary .....W. B. FLICK.....Lawrence.

Members of Committee on Horticulture.

First District .....W. J. RITTERSKAMP.....Princeton.
Second District .....R. D. SIMPSON .....Vincennes.
Third District .....CHAS. N. LINDLEY .....Salem.
Fourth District .....JOHN TILSON.....Franklin.
Fifth District .....JAMES A. LITTLE.....Cartersburg.
Sixth District .....D. E. HUFFMAN .....Winchester.
Seventh District .....J. J. MILHOUS .....Valley Mills.
Eighth District .....A. W. SHOEMAKER.....Daleville.
Ninth District .....J. M. SNODGRASS.....Kirklin.
Tenth District .....H. W. HENRY.....Laporte.
Eleventh District .....L. B. CUSTER.....Logansport.
Twelfth District .....C. W. FOOTE ....South Bend.
Thirteenth District.....J. C. GROSSMAN.....Wolcottville.

Executive Committee.

E. Y. TEAS, Centerville. Expires 1907.

WALTER S. RATLIFF, Richmond. Expires 1908.

Prof. JAMES TROOP, Lafayette. Expires 1906.

Superintendent Experimental Orchard.

JOE A. BURTON, Mitchell.

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OFFICERS OF THE INDIANA HORTICULTURAL SOCIETY SINCE ITS ORGANIZATION IN 1860.

Date.	President.	First Vice-President.	Secretary.	Treasurer.
1860	*Reuben Ragan	William Miller	Wm. H. Loomis	John C. Teas.
1861-2	*John A. Matson	*William Miller	*Wm. H. Loomis	John C. Teas.
1863	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	John C. Teas.
1864	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	John C. Teas.
1865	I. D. G. Nelson	Joseph Orr	Geo. M. Beeler	Calvin Fletcher.
1866	I. D. G. Nelson	*Joseph Orr	*Geo. M. Beeler †Samuel V. Morris	Calvin Fletcher.
1867	I. D. G. Nelson	Allen Furnas	Seth W. Pearson ‡Joseph Gilbert	J. S. Dunlop.
1868	I. D. G. Nelson	*Allen Furnas	Seth W. Pearson ‡Joseph Gilbert	*J. S. Dunlop.
1869	*I. D. G. Nelson	S. Burnett	T. A. Bland ‡W. H. Ragan	Charles Lowder.
1870	Allen Furnas	J. C. Ratliff	Seth W. Pearson ‡W. H. Ragan	Charles Lowder.
1871	Allen Furnas	J. C. Ratliff	W. H. Ragan	Charles Lowder.
1872	J. C. Ratliff	I. S. Jessup	W. H. Ragan	Charles Lowder.
1873	J. C. Ratliff	I. S. Jessup	J. G. Kingsbury	Charles Lowder.
1874	J. C. Ratliff	*I. S. Jessup	W. H. Ragan	Charles Lowder.
1875	Joseph Gilbert	J. A. Mendenhall	W. H. Ragan	Charle- Lowder.
1876	Joseph Gilbert	*J. A. Mendenhall	W. H. Ragan	Charles Lowder.
1877	Sylvester Johnson	J. M. Bulla	W. H. Ragan	Daniel Cox.
1878	Sylvester Johnson	J. M. Bulla	W. H. Ragan	Daniel Cox.
1879	Sylvester Johnson	*J. M. Bulla	W. H. Ragan	Daniel Cox.
1880	Sylvester Johnson	S. Burnett	W. H. Ragan	Daniel Cox.
1881	Sylvester Johnson	*S. Burnett	W. H. Ragan	Daniel Cox.
1882	Sylvester Johnson	J. B. Elliott	W. H. Ragan	Daniel Cox.
1883	Sylvester Johnson	C. M. Hobbs	‖W. H. Ragan †C. M. Hobbs	Daniel Cox.
1884	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1885	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1886	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1887	Sylvester Johnson	E. Y. Teas	C. M. Hobbs	Daniel Cox.
1888	Allen Furnas	W. A. Workman	C. M. Hobbs	Daniel Cox.
1889	*Allen Furnas	J. C. Stevens	C. M. Hobbs	Daniel Cox.
1890	J. C. Ratliff	Joe A. Burton	C. M. Hobbs	*Daniel Cox. †S Johnson.
1891	E. J. Howland	Joe A. Burton	W. H. Ragan	W. A. Workman.
1892	E. J. Howland	E. Y. Teas	W. H. Ragan	W. A. Workman.
1893	C. M. Hobbs	E. Y. Teas	W. H. Ragan	W. A. Workman.
1894	C. M. Hobbs	E. Y. Teas	W. H Ragan	F. Beeler, Sr.
1895	C. M. Hobbs	E. Y. Teas	W. H. Ragan	*F. Beeler, Sr.
1896	C. M. Hobbs	E. Y. Teas	Jas. Troop	Isham Sedgwick.
1897	C. M. Hobbs	E. Y. Teas	Jas. Troop	Isham Sedgwick.
1898	C. M. Hobbs	E. Y. Teas	Jas. Troop	Sylvester Johnson.
1899	C. M. Hobbs	E. Y. Teas	Jas. Troop	Sylvester Johnson.
1900	C. M. Hobbs	Mrs. W. W. Stevens.	Jas. Troop	Sylvester Johnson.
1901	C. M. Hobbs	Mrs. W. W. Stevens.	Jas. Troop	Sylvester Johnson.
1902	W. W. Stevens	E. B. Davis	W. B. Flick	Sylvester Johnson.
1903	W. W. Stevens	H. H. Swaim	W. B. Flick	Sylvester Johnson.
1904	W. W. Stevens	H. H. Swaim	W. B. Flick	Sylvester Johnson.
1905	W. W. Stevens	H. H. Swaim	W. B. Flick	L. B. Custer.

*Deceased. †Appointed to vacancy. ‡Corresponding Secretary. ‖Resigned.

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CONSTITUTION AND BY-LAWS

OF THE

INDIANA HORTICULTURAL SOCIETY

CONSTITUTION.

Article I. This organization shall be known as the Indiana Horticultural Society.

Article II. The objects of the Society are to develop facts and promulgate information pertaining to the science and art of horticulture.

Article III. Its officers shall consist of a President, Vice-President, Secretary, Treasurer, and an Executive Committee of three.

Article IV. There shall be a Horticultural Committee, consisting of one member from each Congressional District, to be elected annually.

Article V. Its members shall consist of annual members, paying a fee of one dollar per annum, into the treasury of the Society (except as provided in by-laws), and honorary members, who shall be elected by the Society for merit as horticulturists of distinction, who may at pleasure participate in the deliberations of the Society. Members' wives will be members without fee.

Article VI. Each member shall be entitled to a copy of the transactions of the Society as often as the same shall be published.

Article VII. The seal of the Society shall consist of an outer rim, embracing the inscription, "Indiana Horticultural Society;" within this, and above the central figure, consisting of a vase of flowers, a pear and apple resting upon a section of vine with its fruit, the words, "Organized 1860;" below, "Incorporated 1875."

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BY-LAWS.

I. The President shall preside at all meetings of the Society; he, together with the Secretary, shall have power to call meetings of the Executive Committee; he shall present to the Society in his annual address such suggestions and recommendations as may seem appropriate, and shall appoint all special committees unless otherwise directed by the Society.

II. The Vice-President shall preside in the absence of the President.

III. The Secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the Society; establish and maintain correspondence with all local, county, district and State horticultural societies, and secure by exchange their transactions, as far as possible, to aid the President, as an executive officer, in the dispatch of business relating to the meetings of the Society, preparing and publishing circulars and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the Society an abstract of the matter that has come into his possession, which, with its approval, shall become part of the transactions for the current year. He shall also act as librarian for the Society, and shall have the care and custody of its room and its property, under such regulations as may be adopted for the government thereof.

IV. The Treasurer shall receive from the Secretary and hold all funds of the Society, paying out the same only on the order of the Secretary, countersigned by the President.

V. Each member of the Horticultural Committee shall make annual reports to the Society, embracing such suggestions and recommendations as may to him seem best for the promotion of the horticultural interests of said district, and he shall give such attention to the organization and building up of local societies in his district as may be within his power.

VI. The officers shall be elected annually by ballot vote, and shall serve until their successors are elected and qualified.

VII. The Executive Committee shall be elected as follows: One for one year, one for two years and one for three years. Hereafter one member shall be elected annually for a term of three years. This committee shall require of the Treasurer such security as may be deemed sufficient for the safe keeping of the funds of the Society. They shall also assist in the preparation of a program for the regular meetings.

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VIII. The objects of the Society being to collect, condense and collate information relative to varieties of fruits and other horticultural products, and dispense the same among the people of the State, every member shall pay into the treasury one dollar a year for the purpose of publishing and other expenses: Provided, That members of local horticultural societies may become members by paying into the treasury, through their respective local organizations, the sum of fifty cents each. Any person interested in horticulture may become a member by forwarding to the Secretary the fee of membership.

IX. The President, Secretary and Executive Committee may call a meeting of the Society at any time and place they may consider advisable by a notice of thirty days in the public press, or by circulars properly distributed.

X. This Society shall hold an annual meeting on the first Wednesday in December of each year, and at such place as the Society shall designate at its previous meeting, and semiannual and called meetings may be held as provided for in the preceding section.

XI. The officers of this Society shall constitute a Board of Horticulture, five of whom shall be a quorum for the transaction of business, the officers of the Society to be officers of the Board, said Board to meet immediately on the adjournment of the Society, and afterward on its own adjournment. It shall be the duty of the Board of Horticulture to investigate all accounts or claims against the Society, when presented for payment; to collect horticultural information, for which it may employ an agent, or agents, to visit different portions of this or adjoining States, and may draw on the treasury for money to pay the necessary expenses, when there is money in the treasury not otherwise needed, and said Board shall make full and definite report of its proceedings to the next regular meeting of the Society.

XII. In all exhibitions by this Society the exhibits shall be made in the name of the grower, who must be a member of the Society.

XIII. The Congressional Districts shall constitute the several Horticultural Districts as provided for in Article III of the Constitution.

XIV. These by-laws may be amended at any regular meeting of the Society by a majority vote.

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LIST OF MEMBERS

OF THE

Indiana Horticultural Society

FOR 1905.

LIFE MEMBERSHIPS.

Name.	*Postoffice.*	*County.*	*When Became Member.*
Burton, Joe A.	Orleans	Orange	1885
Butler, Prof. A. W.	Indianapolis	Marion	
Conley, John	Richmond	Wayne	1900
Cowing, Granville	Muncie	Delaware	1877
Fletcher, Calvin*	Indianapolis	Marion	
Hobbs, C. M	Bridgeport	Marion	1875
Kane, Morgan	Mitchell	Lawrence	
Morris, Thomas B.	Richmond	Wayne	
Ragan, W. H.	Washington, D. C., Dept. of Agriculture		1860
Ratliff, Joseph C.	Richmond	Wayne	1863
Shanklin, A. Y	Bringhurst	Carroll	1890
Teas, E. Y.	Centerville	Wayne.	Charter member
Woods, Arthur Earl	Pecksburg	Putnam	

HONORARY MEMBERS, 1905.

Dr. L. H. Bailey	Ithaca, N. Y.	
Prof. S. A. Beach	Geneva, N. Y.	
Prof. T. J. Burrill	Champaign, Ill.	
Prof. John Craig	Ithaca, N. Y.	
H. M. Dunlap	Savoy, Ill.	
Mrs. H. M. Dunlap	Savoy, Ill.	
W. W. Farnsworth	Waterville, Ohio	
Chas. W. Garfield	Grand Rapids, Mich	
Prof. W. J. Green	Wooster, Ohio	
J. H. Hale	South Glastonbury, Conn	

*Deceased.

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Name.	*Postoffice.*	*County.*	*When Became Member.*
Jas. L. Keach	Indianapolis, Ind		
Prof. W. B. Lazenby	Columbus, Ohio		
Edgar Sanders	Chicago, Ill.		
J. W. Stanton	Richview, Ill		
Prof. L. R. Taft	Agricultural College, Mich		
Prof. H. E. VanDernam	Washington, D. C.		
S. D. Williard	Geneva, N. Y		

LIST OF ANNUAL MEMBERS, 1904.

Name.	*Postoffice.*	*County.*	*When Became Member.*
Albertson, Emory	Bridgeport	Marion	
Albertson, Mrs. Emory	Bridgeport	Marion	
Aiken, W. W	Franklin	Johnson	1901
Aiken, Mrs. W. W	Franklin	Johnson	1901
Alward, Geo. H	South Bend	St. Joseph	1904
Anderson, E. D	Mentone	Kosciusko	
Anderson, Mrs. E. D	Mentone	Kosciusko	
Anderson, O. C	Mentone	Kosciusko	
Anderson, Mrs. O. C	Mentone	Kosciusko	
Andrews, Wm. H	Lagrange	Lagrange	
Andrews, Mrs. Wm. H	Lagrange	Lagrange	
Apple, Jno. W	Oaklandon	Marion	1875
Apple, Mrs. Jno. W	Oaklandon	Marion	1875
Arbuckle, Alvin	Clermont	Marion	1905
Arbuckle, Mrs. Alvin	Clermont	Marion	1905
Allen, D	Greencastle	Putnam	1905
Allen, Mrs. D	Greencastle	Putnam	1905
Baldwin, T. A	Oxford	Benton	
Baldwin, Mrs. T. A	Oxford	Benton	
Bartholomew, H. S. K	Goshen	Elkhart	1903
Bartholomew, Mrs. H. S. K	Goshen	Elkhart	1903
Bash. C. S	Fort Wayne	Allen	1903
Bash, Mrs. C. S	Fort Wayne	Allen	1903
Barnett, W. J	Charlestown		1905
Barnett, Mrs. W. J	Charlestown		1905
Barr, R. J	Washington	Daviess	
Barr, Mrs. R. J	Washington	Daviess	
Baugher, Nelson	Valentine		1905
Baugher, Mrs. Nelson	Valentine		1905

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Name.	Postoffice.	County.	When Became Member.
Beard, Mrs. Jonathan	New Albany	Floyd	1865
Beck, R. L	Connersville		1903
Beck, Mrs. R. L	Connersville		1903
Bell, W. A	Indianapolis	Marion.	1905
Bell, Mrs. W. A	Indianapolis	Marion.	1905
Bell, E. H	Richmond		1905
Bell, Mrs. E. H.	Richmond		1905
Berryman, W. L	Tipton	Tipton.	1896
Berryman, Mrs. W. L	Tipton	Tipton	1896
Beeler, John E	Zionsville		1905
Beeler, Mrs John E	Zionsville		1905
Benoy, Ran	Mathews	Grant	1891
Benoy, Mrs. Ran	Mathews	Grant	1891
Bermaner, Dr. Joe M	Maywood	Marion	1905
Bermaner, Mrs. Joe M	Maywood	Marion	1905
Billingsley, J. J. W	Malott Park	Marion	
Billingsley, Mrs. J. J. W.	Malott Park	Marion	
Billingsley, Samuel	Greenwood	Marion	1904
Billingsley, Mrs. Samuel	Greenwood	Marion	1904
Biliter, Ben. F	Huntington	Huntington	
Biliter, Mrs. Ben. F	Huntington	Huntington	
Blasdel, Amos	Broad Ripple	Marion	1904
Blasdel, Mrs. Amos	Broad Ripple	Marion	1904
Blue, E. F	Monticello	White	1903
Bogue, A. H	Lima	Lagrange	1903
Bogue, Mrs. A. H	Lima	Lagrange	1903
Bricker, Enos	Brimfield	Noble	
Bricker, Mrs. Enos	Brimfield	Noble	
Bridges, John M	Dugger	Sullivan	
Bridges, Mrs. John M	Dugger	Sullivan	
Buck, H. F	Elberfeld	Warrick	1904
Buck, H. F	Elberfeld	Warrick	1904
Bullock, L. O	Lagrange	Lagrange	
Bullock, Mrs. L. O	Lagrange	Lagrange	
Burris, J. B	Cloverdale	Putman	
Burris, Mrs. J. B	Cloverdale	Putman	
Campbell, Geo. B	Bloomington	Monroe	
Campbell, Mrs. Geo. B.	Bloomington	Monroe	
Cantley, J. M	Logansport	Cass	1905
Cantley, Mrs. J. M	Logansport	Cass	1905

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Name.	*Postoffice.*	*County.*	*When Became Member.*
Carr, Prof. J. W	Anderson	Madison	1904
Carr, Mrs. J. W	Anderson	Madison	1904
Case, Riley C	Lagrange	Lagrange	
Case, Mrs. Riley C	Lagrange	Lagrange	
Cavanaugh, H	Wolcottville	Lagrange	1903
Clark, Ed. J	Shelbyville	Shelby	1903
Clayton, Wm. H	Wolcottville	Lagrange	1905
Clayton, Mrs. Wm. H	Wolcottville	Lagrange	1905
Coffin, J. F	Greenfield	Hancock	1905
Coffin, Mrs. J. F	Greenfield	Hancock	1905
Cole, B. F	Trafalgar	Johnson	1902
Cole, Mrs. B. F	Trafalgar	Johnson	1902
Coleman, S. S	Fort Wayne	Allen	1903
Coleman, Mrs. S. S	Fort Wayne	Allen	1903
Conger, Sid	Shelbyville	Shelby	1902
Cotton, I. N	Indianapolis	Marion	
Custer, L. B	Logansport	Cass	1870
Custer, Mrs. L. B	Logansport	Cass	1870
Carver, W. H	Greencastle	Putman	1905
Darlington, Zeba	Pendleton	Madison	1902
Darlington, Mrs. Zeba	Pendleton	Madison	1902
Daubenspect, J. W	Mattsville	Hamilton	1905
Daubenspect, Mrs. J. W	Mattsville	Hamilton	1905
Davis, B. A	Laporte	Laporte	1894
Davis, Mrs. B. A	Laporte	Laporte	1894
Daughty, Deolen	Cambridge City	Wayne	1905
Daughty, Mrs. Deolen	Cambridge City	Wayne	1905
Davis, Evan B	Danville	Hendricks	1901
Davis, Mrs. Evan B	Danville	Hendricks	1901
Deal, L. E	Lagrange	Lagrange	1905
Deal, Mrs. L. E	Lagrange	Lagrange	1905
DeVilbiss, W. T	Fort Wayne	Allen	
DeVilbiss, Mrs. W. T	Fort Wayne	Allen	
Dietrick, John J	Borden	Jackson	1905
Dietrick, Mrs. John J	Borden	Jackson	1905
Dinsmore, Joe S	Bloomington	Monroe	
Dinsmore, Mrs. Joe S	Bloomington	Monroe	
Doan, John L	Westfield	Hamilton	1904
Dorner, Fred. J., Jr	Lafayette	Tippecanoe	
Dorner, Mrs. Fred. J., Jr.	Lafayette	Tippecanoe	

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Name.	Postoffice.	County.	When Became Member.
Eaton, Mrs. Josiah	Lagrange	Lagrange	1904
Eickhoff, Ed. A	Wanamaker	Marion	1873
Eickhoff, Mrs. Ed. A	Wanamaker	Marion	1878
Eller, Thos	Bloomington	Monroe	
Eller, Mrs. Thos	Bloomington	Monroe	
Eshelman, A. L	Wolcottville	Lagrange	
Eshelman, Mrs. A. L	Wolcottville	Lagrange	
Eshelman, Henry	Wolcottville	Lagrange	
Eshelman, Mrs. Henry	Wolcottville	Lagrange	
Eshelman, Levi	Wolcottville	Lagrange	
Eshelman, Mrs. Levi	Wolcottville	Lagrange	
Eshelman, L. L	Wolcottville	Lagrange	
Eshelman, Mrs. L. L	Wolcottville	Lagrange	
Eshelman, Adrian C	Wolcottville	Lagrange	1906
Eshelman. Mrs. Adrian C	Wolcottville	Lagrange	1906
Ellison, R	Lagrange	Lagrange	
Ellison, Mrs. R	Lagrange	Lagrange	
Evans, James B	Bluffton	Wells	1904
Evans, Mrs. James B	Bluffton	Wells	1904
Febles, George	Kendallville	Noble	
Febles, Mrs. George	Kendallville	Noble	
Fess, Fred	Bloomington	Monroe	
Fess, Mrs. Fred	Bloomington	Monroe	
Fisher, Eugene	Lagrange	Lagrange	1906
Fisher, Mrs. Eugene	Lagrange	Lagrange	1906
Fitzpatrick, Mrs. Laura T.	Whiteland	Johnson	
Flanner, Frank W	Indianapolis	Marion	
Flanner, Mrs. Frank W	Indianapolis	Marion	
Flick, W. B	Lawrence	Marion	1876
Flick, Mrs. W. B	Lawrence	Marion	1876
Foote, Henry G	Albion	Noble	1903
Foote, Mrs. Henry G	Albion	Noble	1903
Foote, C. W	South Bend	St. Joseph	1903
Foote, Mrs. C. W	South Bend	St. Joseph	1903
Forbes, F. A	Plymouth	Marshall	1905
Forbes, Mrs. F. A	Plymouth	Marshall	1905
Frame, J. R	South Bend	St. Joseph	
Frame, Mrs. J. R	South Bend	St. Joseph	
Fry, W. H	Greenwood	Johnson	
Furgeson, L. E	White Pigeon, Mich		1904
Furgeson, Mrs. L. E	White Pigeon, Mich		1904

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Name.	*Postoffice.*	*County.*	*When Became Member.*
Garmire, Marion	Lagrange	Lagrange	1903
Garmire, Mrs. Marion	Lagrange	Lagrange	1903
Garretson, Amos	Pendleton	Madison	
Garretson, Mrs. Amos	Pendleton	Madison	
Garretson, Chas. A	Pendleton	Madison	
Garretson, Davis	Pendleton	Madison	1894
Garrett, F. B	Burns City	Martin	1905
Garrett, Mrs. F. B	Burns City	Martin	1905
German, Kali Works	562 Monadnock Blk., Chicago, Ill		
Gloyd, J. D	Fort Wayne	Allen	1903
Gloyd, Mrs. J. D	Fort Wayne	Allen	1903
Goble, D. H	Greenfield	Hancock	
Goble, Mrs. D. H	Greenfield	Hancock	
Good, M. J	Avilla	Noble	
Good, Mrs. M. J	Avilla	Noble	
Graham, A. A	Liberty	Union	
Graham, Mrs. A. A	Liberty	Union	
Greene, W. T., M. D	Albion	Noble	1904
Greene, Mrs. W. T	Albion	Noble	1904
Grossman, J. C	Wolcottville	Lagrange	1893
Grossman, Miss Mary	Wolcottville	Lagrange	1883
Gustin, E. R	Peru	Miami	1900
Haines, Noah C	Pendleton	Madison	1896
Haines, Mrs. Noah C	Pendleton	Madison	1897
Haines, H. E	Granger	St. Joseph	1904
Haines, Mrs. H. E	Granger	St. Joseph	1904
Hale, Henry J	Indianapolis	Marion	1890
Hale, Mrs. Henry J	Indianapolis	Marion	1890
Halstead, Wm	Rensselaer	Jasper	
Halstead, Mrs. Wm	Rensselaer	Jasper	
Hardy, Thos. M	Pendleton	Madison	1897
Hardy, Mrs. Thos. M	Pendleton	Madison	1897
Harper, John E	Morristown	Shelby	1905
Hazelett, Samuel A	Greencastle	Putnam	1902
Hazelett, Mrs. Samuel A	Greencastle	Putnam	1902
Hartzler, D. J	Topeka	Lagrange	1903
Hartzler, Mrs. D. J	Topeka	Lagrange	1903
Henby, J. K	Greenfield	Hancock	1885
Henby, Mrs. J. K	Greenfield	Hancock	1885

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Name.	*Postoffice.*	*County.*	*When Became Member.*
Henderson, R. D	Pleasantville	Sullivan	
Henry, W. H	Laporte	Laporte	1898
Henry, Mrs. W. H	Laporte	Laporte	1898
Hess, Ed	Brook	Newton	1893
Hitchcock, Don K	Brimfield	Noble	
Hitchcock, Mrs. Don K	Brimfield	Noble	
Hitz, J. E	Indianapolis	Marion	1902
Hitz, Mrs. J. E	Indianapolis	Marion	1902
Hobbs, E. M. C	Salem	Washington	
Hobbs, Mrs. E. M. C	Salem	Washington	
Hoff, Geo. W	Shipshewana	Lagrange	1904
Hoff, Mrs. Geo. W	Shipshewana	Lagrange	1904
Hoffman, D. E	Winchester	Randolph	
Hoffman, Mrs. D. E	Winchester	Randolph	
Hoover, John	Spiceland	Henry	
Hoover, Mrs. John	Spiceland	Henry	
Hoover, O. P	Bridgeport	Marion	1903
Hoover, Mrs. O. P	Bridgeport	Marion	1903
Horner, M. E	Lima	Lagrange	1903
Horner, Mrs. M. E	Lima	Lagrange	1903
Howland, Chas. A	Malott Park	Marion	1860
Howland, Elisha J	Malott Park	Marion	1860
Howland, Mrs. Elisha J	Malott Park	Marion	1860
Huey, M. G	South Bend	St. Joseph	
Huey, Mrs. M. G	South Bend	St. Joseph	
Huffman, T. J	Henryville	Clark	1905
Huffman, Mrs. T. J	Henryville	Clark	1805
Imes, W. A	Brimfield	Noble	1903
Imes, Mrs. W. A	Brimfield	Noble	1903
Jackson, W. C	Lagrange	Lagrange	
Jackson, Mrs. W. C	Lagrange	Lagrange	
Jacobs, Chas	Pendleton	Madison	
Jacobs, Mrs. Chas	Pendleton	Madison	
Jarrettson, A. J	Montpelier	Blackford	1903
Jarrettson, Mrs. A. J	Montpelier	Blackford	1903
Jester, J. N	Colburn	Tippecanoe	
Jester, Mrs. J. N	Colburn	Tippecanoe	
Jones, Isaac B	Pendleton	Madison	1903
Jones, Mrs. Isaac B	Pendleton	Madison	1903

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Name.	Postoffice.	County.	When Became Member.
Johnson, Sylvester	Irvington	Marion	1860
Johnson, Mrs. Sylvester	Irvington	Marion	1901
Johnson, D. B	Mooresville	Morgan	
Johnson, Mrs. D. B	Mooresville	Morgan	
Johnson, Will	Fort Wayne	Allen	1903
Keasey, Ezra	Lagrange	Lagrange	1904
Keasey, Mrs. Ezra	Lagrange	Lagrange	1904
Kell, Geo. W	Huntertown	Allen	1902
Kell, Mrs. George W	Huntertown	Allen	1902
Kelley, Samuel	Columbus	Bartholomew	1905
Kelley, Mrs. Samuel	Columbus	Bartholomew	1905
Kelsay, W. A	Fort Wayne	Allen	1903
Kelsay, Mrs. W. A	Fort Wayne	Allen	1903
Kimmell, J. C	Ligonier	Noble	1897
Kimmell, Mrs. J. C	Ligonier	Noble	1897
King, Caleb W	Richmond	Wayne	1900
King, Mrs. Caleb W	Richmond	Wayne	1900
King, Chris	Rushville	Rush	1901
King, Mrs. Chris	Rushville	Rush	1901
Kingsbury, J. G	Irvington	Marion	1870
Kingsbury, Mrs. J. G	Irvington	Marion	1870
Kinsey, W. E	Salem Center	Steuben	1904
Kinsey, Mrs. W. E	Salem Center	Steuben	1904
Knaub, Ben	North Vernon	Jennings	
Knaub, Mrs. Ben	North Vernon	Jennings	
Kring, J. W	South Bend	St. Joseph	1903
Kring, Mrs. J. W	South Bend	St. Joseph	1903
Lafuse, W. H	Liberty	Union	
Lafuse, Mrs. W. H	Liberty	Union	
Lampman, O. A	Topeka	Lagrange	
Lampman, Mrs. O. A	Topeka	Lagrange	
Latta, Prof. W. C	Lafayette	Tippecanoe	
Latta, Mrs. W. C	Lafayette	Tippecanoe	
Linnen, W. F	Noblesville	Hamilton	
Linnen, Mrs. W. F	Noblesville	Hamilton	
Leaming, Henry	Romney	Tippecanoe	
Leaming, Mrs. Henry	Romney	Tippecanoe	
Leitzman, W. F	Mooresville	Morgan	1882
Leitzman, Mrs. W. F	Mooresville	Morgan	1882

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Name.	Postoffice.	County.	When Became Member.
Libey, C. N	Lima	Lagrange	1902
Libey, Mrs. C. N	Lima	Lagrange	1902
Lindley, Chas. N	Salem	Washington	
Lindley, Mrs. Chas. N	Salem	Washington	
Listenfelt, Jacob	Pennville	Jay	1903
Listenfelt, Mrs. Jacob	Pennville	Jay	1903
Little, James A	Cartersburg	Hendricks	1863
Little, Mrs. James A	Cartersburg	Hendricks	1863
Lodewick, A. G	Auburn	Dekalb	1904
Lodewick, Mrs. A. G	Auburn	Dekalb	1904
Louth, C	Battle Ground	Tippecanoe	
Low, John W	Topeka	Lagrange	1902
Low, Mrs. John W	Topeka	Lagrange	1902
Lowth, Chas	Lagrange	Lagrange	
Lowth, Mrs. Chas	Lagrange	Lagrange	
Maish, D. F	Frankfort	Clinton	
Maish, Mrs. D. F	Frankfort	Clinton	
Marsh David C	Edinburg	Johnson	1903
Marsh, Mrs. David C	Edinburg	Johnson	1903
Mathews, George	South Bend	St. Joseph	1903
Mathews, Mrs. George	South Bend	St. Joseph	1903
Mays, C. C	Frankton	Madison	1903
Mays, Mrs. C. C	Frankton	Madison	1903
McCarty, J. H	Huntertown	Allen	
McCarty, Mrs. J. H	Huntertown	Allen	
McClure, Chas	Angola	Steuben	
McClure, Mrs. Chas	Angola	Steuben	
McCain, A. A	Indianapolis	Marion	1904
McCain, Mrs. A. A	Indianapolis	Marion	1904
McIntosh, G. W	Rega	Orange	
McIntosh, Mrs. G. W	Rega	Orange	
Merritt, W	Danville	Hendricks	1905
Merritt, Mrs. W	Danville	Hendricks	1905
Milhous, J. J	Valley Mills	Marion	1890
Milhous, Mrs. J. J	Valley Mills	Marion	1890
Mills, J. W	Lagrange	Lagrange	
Mills, Mrs. J. W	Lagrange	Lagrange	
Moffett, Frank	Carmel	Hamilton	1902
Moffett, Mrs. Frank	Carmel	Hamilton	1902
Moon, H. E	Portland	Jay	1905

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Name.	*Postoffice.*	*County.*	*When Became Member.*
Moon, Mrs. H. E	Portland	Jay	1905
Moore, Dr. Henry	Irvington	Marion	
Moore, C. B	Monticello	White	1905
Moore, Mrs. C. B	Monticello	White	1905
Moorehouse, Jno. W	Albion	Noble	1898
Moorehouse, Mrs. Jno. W	Albion	Noble	1898
Moyer, G. N	Laketon	Wabash	1901
Moyer, Mrs. G. N	Laketon	Wabash	1901
Mozingo, Miss Mary M	Marion	Grant	
Mustard, Wm	Indianapolis, 4610 N. Illinois St	Marion	
Mustard, Mrs. Wm	Indianapolis	Marion	
Nelson, M. J	Topeka	Lagrange	1903
Nelson, Mrs. M. J	Topeka	Lagrange	1903
Newby, Thos. T	Carthage	Rush	1890
Newby, Mrs. Thos. T	Carthage	Rush	1890
Newman, R. H	Lima	Lagrange	1900
Newman, Mrs. R. H	Lima	Lagrange	1900
Newton, Geo. F	South Bend	St. Joseph	
Newton, Mrs. Geo. F	South Bend	St. Joseph	
Norris, A. D	Anderson	Madison	1901
Norris, Mrs. A. D	Anderson	Madison	1901
Nicar, Robt	South Bend	St. Joseph	1906
Nicar, Mrs. Robt	South Bend	St. Joseph	1906
Nicar, V	South Bend	St. Joseph	1906
Nicar, Mrs. V	South Bend	St. Joseph	1906
Osborn, Elam	Economy	Wayne	1903
Osborn, Mrs. Elam	Economy	Wayne	1903
Osborn, John	Richmond	Wayne	1904
Osborn, Mrs. John	Richmond	Wayne	1904
Overman, J. C	Knightstown	Henry	1903
Overman, Mrs. J. C	Knightstown	Henry	1903
Parker, Frank	Wolcottville	Lagrange	
Perry, Alexander	McCutcheonville	Vanderburgh	
Perry, Mrs. Alexander	McCutcheonville	Vanderburgh	
Peterson, Henry C	Albion	Noble	
Peterson, Mrs. Henry C	Albion	Noble	
Pflender, D. C	Acton	Marion	1905
Phelps, W. W	Noblesville	Hamilton	

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Name.	Postoffice.	County.	When Became Member.
Phelps, Mrs. W. W	Noblesville	Hamilton	
Pulling, John	South Bend	St. Joseph	1906
Pulling, Mrs. John	South Bend	St. Joseph	1906
Randle, H. M	Greencastle	Putnam	1905
Randle, Mrs. H. M	Greencastle	Putnam	1905
Ratliff, Walter S	Richmond	Wayne	
Ratliff, Mrs. Walter S	Richmond	Wayne	
Reed, W. C	Vincennes	Knox	1886
Reed, Mrs. W. C	Vincennes	Knox	1886
Reid, Murdock & Co	Chicago, Ill		1903
Ridgeway, Robert	Amboy	Miami	1903
Ridgeway, Mrs. Robert	Amboy	Miami	1903
Ritterskamp, W. J	Princeton	Gibson	1891
Ritterskamp, Mrs. W. J	Princeton	Gibson	1891
Robison, E. A	Greenwood	Johnson	
Robison, Mrs. E. A	Greenwood	Johnson	
Rockhill, D. K	South Bend	St. Joseph	
Rockhill, Mrs. D. K	South Bend	St. Joseph	
Robbins, Cassandria	Indianapolis	Marion	
Rowe, Chas	Valentine	Lagrange	1903
Rowe, Mrs. Chas	Valentine	Lagrange	1903
Roy, Geo. W	Wolcottville	Lagrange	1904
Roy, Mrs. Geo. W	Wolcottville	Lagrange	1904
Royer, E. E	Lagrange	Lagrange	
Royer, Mrs. E. E	Lagrange	Lagrange	
Royer, C. S	Lagrange	Lagrange	
Royer, Mrs. C. S	Lagrange	Lagrange	
Ruhl, Benj	Lima	Lagrange	
Ruhl, Mrs. Benj	Lima	Lagrange	
Schaeffer, D. B	Lima	Lagrange	1904
Schaeffer, Mrs. D. B	Lima	Lagrange	1904
Sears, C. W	Lagrange	Lagrange	1904
Sears, Mrs. C. W	Lagrange	Lagrange	1904
Schermerhorn, J. M	Brimfield	Noble	1902
Schermerhorn, Mrs. J. M	Brimfield	Noble	1902
Schofield, C. S	Indianapolis	Marion	1904
Schofield, Mrs. C. S	Indianapolis	Marion	1904
Scholl, Jonas	Lyons Station	Fayette	
Schlotter, J. G	Indianapolis	Marion	1902

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Name.	Postoffice.	County.	When Became Member.
Schlotter, Mrs. J. G	Indianapolis	Marion	1902
Secrest, D. L	Laurel	Franklin	1903
Secrest, Mrs. D. L	Laurel	Franklin	1903
Sheridan, James	Fort Wayne	Allen	1904
Sheridan, Mrs. James	Fort Wayne	Allen	1904
Sherman, E. B	Lagrange	Lagrange	1906
Sherman, Mrs. E. B	Lagrange	Lagrange	1906
Shoemaker, A. W	Daleville	Henry	1892
Shoemaker, Mrs. A. W	Daleville	Henry	1892
Shoemaker, E. B	Lagrange	Lagrange	1906
Shoemaker, Mrs. E. B	Lagrange	Lagrange	1906
Shortridge, Prof. A. C	Irvington	Marion	
Shortridge, Mrs. A. C	Irvington	Marion	
Sidwell, Henry	Knightstown	Henry	
Sidwell, Mrs. Henry	Knightstown	Henry	
Simpson & Son, H. M	Vincennes	Knox	1895
Simpson, Mrs. H. M	Vincennes	Knox	1895
Smith, Al. B	Garfield	Montgomery	1904
Smith, Mrs. Al. B	Garfield	Montgomery	1904
Smith, Chas. C	Lima	Lagrange	1904
Smith, Mrs. Chas. C	Lima	Lagrange	1904
Smith, Dr. Isaac A	Warren	Huntington	1895
Smith, Mrs. Isaac A	Warren	Huntington	1895
Smith, O. C	Fort Wayne	Allen	1904
Smith, Mrs. O. C	Fort Wayne	Allen	1904
Smith, Walter S	Arlington	Rush	1904
Smith, Mrs. Walter S	Arlington	Rush	1904
Smith, Sumner T	Fort Wayne	Allen	1903
Snodgrass, J. M	Kirklin	Clinton	1903
Snodgrass, Mrs. J. M	Kirklin	Clinton	1903
Snyder, J. W	Ossian	Wells	1903
Sorg, Theo	Fort Wayne	Allen	1903
Sorg, Mrs. Theo	Fort Wayne	Allen	1903
Sower, Daniel L	Rome City	Noble	1903
Sower, Mrs. Daniel L	Rome City	Noble	1903
Stanley, Perry J	Albion	Noble	
Stanley, Mrs. Perry J	Albion	Noble	
Starkey, W. D	Zionsville	Boone	1902
Starkey, Mrs. W. D	Zionsville	Boone	1902
Stemple, Milton J	Indianapolis	Marion	1902
Stemple, Mrs. Milton J	Indianapolis	Marion	1902

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Name.	Postoffice.	County.	When Became Member.
Stewart, Prof. Wm.	Burlington, Vt.		
Stewart, Mrs. Wm	Burlington, Vt.		
Stevens, Warder W	Salem	Washington	
Stevens, Mrs. Warder W.	Salem	Washington	
Stineman, Jonas	McCrawsville	Miami	1900
Stineman, Mrs. Jonas.	McCrawsville	Miami	1900
Stinger, B. F.	Charlottesville	Hancock	
Stinger, Mrs. B. F.	Charlottesville	Hancock	
Stough, J. F.	Lagrange	Lagrange	1903
Stough, Mrs. J. F.	Lagrange	Lagrange	1903
Stout, H. M.	Trafalgar	Johnson.	
Stout, Mrs. H. M.	Trafalgar	Johnson.	
Stout, H. W.	Lafayette	Tippecanoe	1905
Stout, Mrs. H. W.	Lafayette	Tippecanoe	1905
Stout, Wilbur C	Monrovia	Morgan	1900
Stout, Mrs. Wilbur C.	Monrovia	Morgan	1900
Swaim, Chas. R.	Zionsville	Boone	1903
Swaim, Mrs. Chas. R	Zionsville	Boone	1903
Swaim, H. H.	South Bend	St. Joseph	1890
Swaim, Mrs. H. H	South Bend	St. Joseph	1890
Swain, Walter A	Pendleton	Madison	
Swain, Mrs. Walter A	Pendleton	Madison	
Swain, C. E	Pendleton	Madison	
Swain, Mrs. C. E	Pendleton	Madison	
Swain, Wm.	Pendleton	Madison	
Swain, Mrs. Wm	Pendleton	Madison	
Swank, Lafayette	Topeka	Lagrange	
Swank, Mrs. Lafayette	Topeka	Lagrange	
Swift, Evan B	Franklin	Johnson.	
Swift, Mrs. Evan B.	Franklin	Johnson	
Talbert, Rev. Wm	Albion	Noble	
Talbert, Mrs. Wm	Albion	Noble	
Thomas, John L	Pendleton	Madison	
Thomas, Mrs. John L	Pendleton	Madison	
Thomas, Snead*	Marion	Grant	1885
Thomas, W. D	Connersville	Fayette	
Thomas, Mrs. W. D.	Connersville	Fayette	
Thompson, R. L	Topeka	Lagrange	1904
Thompson, Mrs. R. L	Topeka	Lagrange	1904
Thorpe, E. R	Washington	Daviess	
Tilson, John*	Franklin	Johnson.	

*Deceased.

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Name.	Postoffice.	County.	When Became Member.
Tilson, Mrs. John	Franklin	Johnson	
Troop, Prof. James	Lafayette	Tippecanoe	1884
Troop, Mrs. James	Lafayette	Tippecanoe	1884
Troth, R. A	Orleans	Orange	1902
Troth, Mrs. R. A	Orleans	Orange	1902
Tucker, W. E	Lagrange	Lagrange	1906
Tucker, Mrs. W. E	Lagrange	Lagrange	1906
Tufts, Elmer G	Aurora	Dearborn	1899
Van Kirk, Mrs. Myrla	Lagrange	Lagrange	1903
Walker, E. J	Sheridan	Hamilton	1905
Walker, Mrs. E. J	Sheridan	Hamilton	1905
Waltman, Wm. M	Nashville	Brown	1903
Waltman, Mrs. Wm. M	Nashville	Brown	1903
Wells, Merit	Clermont	Marion	1901
Wemple, E. C	Valentine	Lagrange	1903
Wemple, Mrs. E. C	Valentine	Lagrange	1903
Widney, H. M	St. Joe	Dekalb	1904
Widney, Mrs. H. M	St. Joe	Dekalb	1904
White, John T	Connersville	Fayette	
White, Mrs. John T	Connersville	Fayette	
Whiteley, Isaac	Cambridge City	Wayne	1903
Whiteley, Mrs. Isaac	Cambridge City	Wayne	1903
Williams, Sam'l T. S	Knightstown	Henry	1885
Williams, Mrs. Sam'l T. S.	Knightstown	Henry	1885
Williams, W. A	Rome City	Noble	
Williams, Mrs. W. A	Rome City	Noble	
Williams, D. A	Southport	Marion	
Williams, Mrs. D. A	Southport	Marion	
Wilson, Theo	Southport	Marion	
Wilson, Mrs. Theo	Southport	Marion	
Woollen, Wm. Watson	Indianapolis	Marion	1902
Woollen, Mrs. Wm. Watson	Indianapolis	Marion	1902
Woodworth, J	Lagrange	Lagrange	
Young, W. S	Franklin	Johnson	
Young, Mrs. W. S	Franklin	Johnson	
Zion, James M	Clarks Hill	Tippecanoe	1892
Zion, Mrs. James M	Clarks Hill	Tippecanoe	1892
Zimmer, H. I	South Bend	St. Joseph	1906
Zimmer, Mrs. H. I	South Bend	St. Joseph	1906

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Forty-Fourth Midsummer Meeting

OF THE

INDIANA HORTICULTURAL SOCIETY

HELD AT

HENRYVILLE, CLARK COUNTY, IND.,

August 9, 10, 1905.

The forty-fourth midsummer meeting of the Indiana Horticultural Society was called to order at 1:30 p. m. Wednesday, August 9th, 1905, with President Warder W. Stevens in the chair, who said:

Ladies and Gentlemen—I am glad to meet and greet so many of you here at the opening session of our meeting. We will now have a selection of music by the orchestra.

(Music by orchestra.)

President Stevens: We will now have the invocation by Reverend Cross, of Henryville:

Rev. Cross: O God, our heavenly Father, we thank Thee that Thou hast permitted so goodly a number to assemble in this grove, and we pray Thee that Thou wilt be with us in the work of this hour. We thank Thee for the privileges and the opportunities which we have of assembling ourselves together in different capacities in this life, and we thank Thee for this privilege of assembling here today. We pray Thee that Thou wilt bless every one who is to take part in this work, and grant, O God, that we may all realize that these bountiful things which we are enjoying come from Thy hand, and that every good and perfect gift cometh from Thee, and that without Thy watchful care over us and Thy bounteous providence showered upon us we would be without all of these blessings. Help us in the work of this Association, and we pray that Thy special blessing shall be upon everyone who shall have

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a part in this work and may it all be done with an eye single to Thy glory, and may we give Thee praise for what Thou hast done, and Thine shall be the honor and glory both now and forever more. Amen.

(Music by the orchestra.)

President Stevens: The next will be the address of welcome by the Reverend Mr. Cross.

Rev. Mr. Cross: Mr. President, Ladies and Gentlemen, and Delegates to this Association, Friends, Fellow Citizens, Hoosiers and All—To me has been assigned the very delightful task of delivering unto you the keys of our town, the best town, in the best county, in the best State in the greatest and best nation that God's gracious and glorious sun shines upon. We are glad that you brought this meeting to our midst. We have bountiful faith in our own section of the country. Some of you folks do not know very much about this section of the country, but as I have already said, we have bountiful faith in it, and we trust that this gathering will beget in you a like faith in this section of the State. It is plain to be seen that we are in the hands of an all-wise Providence, and that He is very good to us. Our garners are fairly groaning under the weight of the golden grain, and you have only to step out and look at the waving cornfields to see the promise of a most bountiful harvest for southern Indiana, such as southern Indiana has never known in all of her history, I am sure. I say again that we have large faith in our section of the State. Our resources are almost boundless—or, I should say, our resources are almost endless—and our possibilities are almost boundless. I put the "almost" for fear that some of you folks might think we had the best country and county on earth. We have plenty of timber, and you will remember a few years ago that our legislature made it possible whereby not only southern Indiana but other parts of the State might know how to take care of their timber. We have the reservation on our border, and I overheard not long since that our excellent Governor said to our worthy Secretary of the State Board of Forestry when he asked him how much of an appropriation there was made for the forestry work and the Secretary told him, "Well, I don't know of any part of the State where it is needed any worse than it is down there." This may be true enough, but I tell you there is no other part of the State where they can make a greater showing than we can down here. We also have resources under the earth which have not been developed, but a limited research has shown that it is there in large quantities in the way of coal, and that we also have gas. Recent development has proved that we have an

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abundant supply of gas under our surface and a superabundance above. We believe in ourselves down here at Henryville, and invite you to a good town. Providence is favoring us here. He has given us an abundant supply of both wet and dry. He gives us plenty of water that brings the blossom to the rye and the rose, and plenty of dry that keeps the blossom away that the rye brings to the nose. However, none of you need to go thirsty. If you do not like common, ordinary pure water, we have only to cite you to our mineral wells, of which we have an abundance in this country, and if you want to know all about these mineral wells and their possibilities I will refer you to Mr. Freeman, Secretary of the State Board of Forestry. In addition to this duty of secretary of the Board he has from time to time been filling the position of financial adviser or confidential adviser to the proprietor of one of the famous mineral wells, and, although he has not authorized us to say so, it is generally understood that there is soon to be a partnership in which Mr. Freeman is to be one of the principal members.

Again I wish to tell you that we are glad to have you with us, and we are going to make your stay with us as pleasant as possible, and when you leave we know you will be glad you came and will come back whenever you have another opportunity. Again I say to you, we welcome you.

President Stevens: In behalf of the State Horticultural Society I wish to say that we will receive this cordial welcome, and will make ourselves at home while we are in your midst. The summer meeting of this society usually goes where the society thinks it can do the most good, and our committee recommended that we come right here to southern Indiana, for this is the garden spot of fruit growing of the State of Indiana, and at the urgent request of Professor Freeman this meeting has been brought here. I must say that you do not fully realize the possibilities of fruit culture here, away back here a few miles in your swamp land, and I never realized it as I did this morning as I drove across the country on my way over here. We have thousands upon thousands of acres of land, and the best fruit land in the State. I venture the prediction that the time is not far distant when these hills will be veritable gardens and vineyards. There is no reason in the world why the people of southern Indiana should not take this hill land and supply all of the great central west with fruits. These hills are fertile. They contain all the elements that are necessary to give us the best fruit in the greatest abundance. These lands, as some of you may know, may be purchased at this time, say from three to five dollars per acre, and with cultivation of the right sort it will not be many

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years until they will sell for as much as the best farming lands in the northern part of the State.

But I do not want to go into a discussion of this matter at this time I wish that the people from other sections of the State would get out and see some of this country for themselves, and then I know they will be ready to verify my assertions.

We, the people of the State Horticultural Society, already feel under obligations to the people here for what they have done for this meeting, and particularly do we feel grateful to Professor Freeman for his efforts to make this meeting a success. I know that our time is somewhat limited. There might be considerable said about the possibilities of fruit growing here in the southern part of Indiana, but we will hear more about this later by other parties who are on the program.

It is necessary for us to change our program a little this afternoon on account of the absence of one or two who were to have been here, and are not here. The next thing on the program will be some music.

(Music by the orchestra.)

President Stevens: Before we go any further I will appoint a committee to pass on the fruits. This committee shall consist of Amos Garretson, of Pendleton; W. A. Bell, of Indianapolis, and J. M. Snodgrass, of Kirklin.

The Committee on Resolutions shall consist of C. M. Hobbs, of Bridgeport; A. W. Shoemaker, of Daleville, and Mrs. Amos Garretson, of Pendleton.

I name these committees at this time that they may get at their work and complete it at the earliest possible date. They can make their reports at tomorrow morning's session.

We have with us Mr. Joe Burton, superintendent of the Experimental Orchard. He has some fruit on exhibit and desires to make a brief statement in regard to the same.

Mr. Joe A. Burton: I brought in some fruit so that all of you might see some fruit from the Experimental Orchard. Some of these trees have just begun to bear, and I thought that some of the members of the society would be glad to see some of the fruit. We did not have an opportunity to select perfect specimens, but took them just as they were.

Mr. Burton had specimens of about 24 seedling apples grown on the Experimental Grounds. Some of them are quite promising.

President Stevens: Does the Secretary wish to make announcements?

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Secretary Flick: This horticultural society was organized in 1860, and it has been working all these many years to get the people of the State of Indiana enthusiastic so that they might raise enough fruit for our own consumption at least, but they have not accomplished that as yet. Unless southern Indiana wakens up I fear it will be years before we do so. As our president has said, we are aware of the fact that there are here great opportunities for fruit growing, the like of which are seldom found in the United States. Our society is composed of about four hundred and forty members. In the last two years the membership has increased about two hundred members. We would like to reach a thousand, and we hope to get quite a number here. The terms are one dollar a year to those who are not members of a local association. If you are a member of a local society, in good standing, your fee will be only fifty cents a year for yourself and wife, and in addition you will share in the credit of making Indiana one of the foremost States in fruit culture, and you will receive many advantages and many helps and helpful hints which you will get in the publications. I have with me the latest publication of the society. If you are a member of this society you are entitled to one of these each year. It contains some of the best thoughts and best discussions of some of our best and ablest men, not only in the State of Indiana, but wherever they can be procured. We get them from any source and every source. I can not name all of the contributors, but among them are Professor Van Deman, whom we all know as foremost in the discussion of practical questions which fruit growers should know about. We had Professor Weigel from the Forest Bureau of Washington, and Professor Rothe, of Michigan, professor of the forestry bureau there, and from our own State some fifteen or twenty of the best and most successful fruit growers. I would like for you to look over these volumes at your leisure and see what subjects are treated, and I am sure that some of you will find some that are of vital importance to you in your business, and it will cost you but fifty cents to become a member. We expect to get up a book of the proceedings of this meeting, including the papers, etc., and it will advertise this region as a fruit growing region. We should be pleased to have you become members of this society.

President Stevens: The first subject this afternoon will be Forestry, by Prof. W. H. Freeman, secretary of the State Board of Forestry, of Indianapolis, whom you all know. We want him to tell us how, in addition to the fruits that we raise, we can raise other trees profitably.

Professor Freeman: Ladies and Gentlemen—I should just like to say, to begin with, that if you wish to know anything about mineral

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wells you can ask me, but if you want to know anything about matrimonial alliances you will have to see Mr. Cross.

It might be inferred that in speaking upon the subject of forestry that I would discuss it from the standpoint of its relation to fruit growing. However, I shall dwell upon that very little from the simple fact that I think every man who gives it due consideration knows the relation. But at this stage of educational development of the subject I feel that it is necessary to talk to you upon another phase of forestry. What I shall say shall not be as a matter of justification or vindication, but simply as an explanation, that we may know the different theories of forestry in this country, and when I have stated them I am willing for you to draw your own conclusions and shall ask you to do so.

Forestry in this country is simply a matter of future education. It is a matter in which the masses have yet to be instructed in order to make it a success. In this day and age a man who discusses the subject of forestry even in an honest official effort has to stand out as a fanatic upon the subject. It is an institution in which one stands upon one side and the masses upon the other side. One must bring the other side to him. This is not an unnatural condition when we consider that since the establishment of the State of Indiana it seems that we have been trying to get rid of the stuff, but now we must change things, and solve this problem. Forestry from a national standpoint is not very old, but in European countries it has been in existence for more than five hundred years, and they have passed through all of the stages of experiment and are now in normal conditions of operation. We have only just begun. Studying in the light of what has already been done for a brief time, we may say that great work has been accomplished; studied in the light of what is yet to do, we have only just begun. In order that you may see the different features of forestry as they are carried on by the United States, and the different States of the United States, I propose to give you a brief synopsis of the plans of each, coming last to the policy of our own State and asking you to compare and draw your own conclusions as to what we are doing, and whether it is right or wrong.

The United States has had a department of forestry for something like twenty years. It now occupies more than sixty millions of acres of forestry reservations, and appropriates in the United States alone more than three hundred thousand dollars annually in the care of this forestry reservation. They are mostly located in the broken lands of the East and West. The main effort is devoted to the problem of irrigation and reclamation. The United States department has wholly altered its plan within the last year, and this affords me satisfaction,

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simply from the fact that I believe it is more practical and is more in line with the people, and the bureaus of forestry in the past have failed to reach the masses of the people because it was not practical enough. The policy for the present year with the United States department is simply forestry, absolute and simple. They are going to discard all of the scientific features which they have had in the past and devote themselves to tree cultivation. In the acquisition of this sixty millions of acres they have acquired a great deal of good agricultural land, as well as broken land. Their policy now is to select from all these different reservations the good, well fitted agricultural land, and declare it open for settlement for agricultural purposes. They intend then to devote their time and money exclusively to the forestry operation upon the cheapest broken lands, and that is our policy, and always has been. So you can see that forestry to become a success must be close to the masses of the people, and you must keep it on that plane. The irrigation problem has been the greatest problem in this country, and it is the one that is bound to be the most beneficial to us. The reclamation of the arid regions of the West for agricultural purposes by means of irrigation can only be accomplished through forestry. Where forests do not exist there can be but one way to get them, and that is to grow them. Thus the United States department will confine its energies to growing trees upon these regions with the ultimate aim of irrigating and reclaiming the arid regions of the West.

There is a popular belief that forestry is a fraud originated by some individual who loved trees more than he loved anything else. I wish to say that such is not the case. Forestry originated from natural conditions, and industrial conditions. We only came to the subject when we were driven to it, and we will only be successful in the future as we are driven to it. I wish to state right at this time my feelings about the matter. I should not be disappointed if it takes the people of this country fifty years to come to a full realization of their duties in this regard. The people at this time are all that can be expected considering past conditions. They are doing all that can be expected of them for the time they have had to think about it, and I want to say candidly that I think this is a good time to get things started. Forestry is not a question of oratory or poetry. It is a question of plain business, and we must get at it. It is plain, common business. In Indiana we have some two thousand four hundred and twenty-six manufacturing institutions helping more than thirty-four thousand people, and the greater portion of them are dependent upon the timber supply for their operation. Thus forestry in Indiana has its industrial foundation, an agricultural foundation and a horticultural foundation. The policy which

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Indiana is following, which I have the honor, and I am proud to be the beginner of it, although it did not originate with me, is a good one. When I first came into the office I sent out over five thousand letters the first six months to the people of Indiana asking them what they thought should be done in the State Board of Forestry. From the replies which were sent in to these letters I framed the policy which Indiana is now pursuing, and I have no cause yet to change it, and I shall pursue that as long as I am left in charge until I accomplish something or nothing, and I believe the people of Indiana will sustain me. The main thing that the people of Indiana aked for was information, not theory. They said to me, "Give us facts." I sought everywhere for facts, and while I found some, I found a good deal of theory, which was not practical, and so I said, we will give you facts. Therefore we framed the bill to buy the State reservation and experimental station, and we worked out the facts and presented them to the people, and when they got the facts they knew what they had.

Forestry in Indiana will naturally be divided into three classes—the co-operative, the individual and the ornamental. Forestry is too long, too drawn out, for the individual to engage in it with the idea of remuneration to himself. It must be a philanthropic movement i[illegible] we must work for generations to come. When I was in school I learned this principle: Every man is born into the world to fulfill a destiny, and to the extent which he falls short of that destiny he becomes that much of a sinner. We came into this world and found plenty, and if we leave it worse than we found it we have been a detriment and a sinner. It is our duty not only to work for ourselves, but for others. So it must be with the movement of forestry; therefore the State and corporation forestry must be the principal movement.

Again, it must be confined to the cheap, broken land, from the simple fact that with the augmented population of today the good agricultural land of this country, and especially of Indiana, will be needed for agricultural purposes to supply the consumption. Therefore, forestry must be devoted to that land which is unfit for good farming, and I am of the opinion that when we once demonstrate that forestry upon the cheap, broken lands of Indiana is a profitable thing then it will be successfully carried on, and until that time it will be theoretical and doubtful. Farmers may plant timber for post timber, but they will not plant for commercial purposes, and that will have to be left to the corporations which have financial standing enough to carry it forward for a long time. It will have to be left to the State today.

In connection with this I wish now to give you some policies of other States for comparison with our own. California has eight million

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eight hundred thousand acres of forest reservation in the mountain land, and appropriates annually fifteen thousand dollars to purchase new lands every year. In addition to that they have tax clauses whereby all defaulting taxes go back to the State for forestry purposes.

Maine has no State forestry reservation, but appropriates annually ten thousand dollars to pay for irrigation and for patrolling the forest regions of the state and extinguish the fires.

Maryland has no State forestry reservation, but appropriates annually thirty-six thousand dollars with which to guard and protect her forests in the mountainous regions. It also has a tax clause by which all lands reverting to the State by reason of taxes are to go to the State for forestry purposes.

Massachusetts appropriates fifty per cent. of all the fines assessed in her State for forestry purposes, which in some instances amounts to a very large sum, and in others to a smaller sum.

Michigan in the last few years has acquired sixty-four thousand acres of forestry reservation, and appropriates annually seven thousand five hundred dollars for the purpose of planting seeds.

Minnesota acquired thirty-four thousand eight hundred and sixty [illegible] appropriates annually eighteen thousand dollars.

New York, the Empire State, has one million four hundred and thirty-seven thousand acres of forestry reservation, and appropriates annually to conduct the same three hundred thousand dollars.

I only cite these, ladies and gentlemen, to show you that forestry is not an infant, but that it is a thing of considerable magnitude. Pennsylvania owns seven hundred thousand acres of forestry reservation and appropriates annually thirty-six thousand dollars to conduct it. In addition to that Pennsylvania appropriates every year three hundred thousand dollars with which to purchase new lands. In addition to this it has a tax clause whereby all escheated lands referring back to the State back to the forestry board.

Ohio has just given the subject of forestry its first move, but it passed a law that all delinquent tax land should be for this purpose, and I am told that it has acquired nearly twenty thousand acres.

Indiana made her first move four years ago in an official way on this subject. It had a board who worked for nothing, and who had eighteen hundred dollars to pay all expenses. We operated for two years in that way. From the next legislature we succeeded in getting sixteen thousand dollars to purchase the present station, and next we got four thousand two hundred, and the last legislature saw fit to raise the appropriation from four thousand two hundred dollars to almost eight thousand five hundred dollars annually, to carry on the work.

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Now the comparison. Minnesota pays ten thousand dollars a year for wardens, who receive all the way from six hundred to fifteen hundred dollars a year. It is their duty when they hear tell of a fire to put it out if they can. Other States have had salaried fire officers. Now, think of it. If a fire occurred in southern Indiana and the fire warden was in Michigan City, the fire would have time to burn over considerable before he could get there to put it out. If this is to be successful it must be brought closer to the people. To be a success it must be drastic, so I myself wrote the present fire law bill, a bill which became the present fire law, in which every road supervisor in the State of Indiana is made a fire warden if fire breaks out any place in his road district, and it is his duty to put this fire out, and to employ all the help he needs to extinguish that fire, and when he calls upon the township trustee he must pay him and all the help he employs $1.50 a day for extinguishing that fire, or for the time occupied in doing so. Let me explain this: If there are many fires in a given locality and the trustee has to pay out two or three hundred dollars I venture to say he will try to find out who started that fire, and the culprit who started the fire is liable for a fine of not less than five or more than fifty dollars, and full damages besides. This is drastic, but I want to say that if it is enforced it will bring results, and in order that it may be enforced there is a clause in that bill wherein it says that it must be the duty of the county prosecutor to prosecute every case, and failure so to do is sufficient evidence for his removal from office. Now, I think that this, to be a success, must come right down to the people, and when every road supervisor in the State of Indiana is a fire warden, and every man he employs is paid $1.50 per day, and he must be paid by the township trustee out of the common fund, the taxpayers and everyone will do their best to prevent damaging fires such as have been known for years and years in the past.

As I said in the start, the subject of forestry is not fully developed yet. In the minds of the great majority of the people there is a feeling of dissatisfaction; that is, they do not feel perfectly willing to be shown. I suppose very few of you have ever heard me explain this policy which we have established, for I seldom ever take occasion to explain it for this reason: There are so many ideas and suggestions made as to what should be done that I have not taken time to explain it to every man that has an idea. It is like sitting around a country store and have some one mention the fact that he has rheumatism, and hear every person around there give a sure cure for rheumatism, even though he may have it so badly he is not able to walk on its account, and is not able to stand up to tell it. So it is with the subject of forestry. Every man has his own idea about it, and I am willing to listen to it.

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The purpose of the station here is to demonstrate practical forestry, just such forestry as every farmer in this State could do with the means he has at hand. They could plant the trees and grow them from the seed on the open land and in the forest lands. In this way we could reforest the broken arid regions in this country. This is not an impossibility. This may not be a financial success; we may fail, but we are not going at it with that intention. We do not expect to do it so. We want the people of Indiana to stay with us and support us, and we should like for delegates from different parts of the country to go over the reservation and see what we are doing, and if it meets with your approval help us in the future. It is true that we have not accomplished all of the things which we should have liked to have accomplished, because we have not had the means with which to do it. I have no censure upon the members of the General Assembly; they have been good, but they could have been better. As an illustration, we asked for an appropriation to cultivate so many acres of land planted with trees. You farmers know that you can not do something for nothing. You can not plant your crop and cultivate it without expense. We planted one hundred and eighty-seven acres in seed last fall. We asked for an appropriation with which to cultivate that land this season. They gave us the appropriation, but they said that they would make it November 1, instead of May 1. Isn't that a splendid time to get your money to cultivate your crops? That is why you see some of this land in the condition that it is today. We have done the best we could; we had hoped to do better. Please give the subject of forestry your candid consideration. It is worthy; it is possible; it is founded on industrial conditions, and it must come by it now or in the future.

I thank you.

President Stevens: I am sure that you have received many important items from Secretary Freeman on the subject of forestry, but as one of the young farmers here I feel discouraged on account of one of the statements made here by the Professor, which is that we who go into forestry now must do it for the future generations. It does not seem to me that this is altogether correct, and I think we can go into it for our own profit. I think it is possible for a young farmer to bring himself in returns within a period of ten or fifteen years. Is that true or not?

Professor Freeman: That is true in certain phases of forestry. If an individual will buy some of this land and wants to cultivate posts and tree timber, it will be all right, but I was speaking of commercial forestry.

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President Stevens: You think the ordinary farmer could invest his money in a small way that would bring him profitable returns?

Professor Freeman: Yes, that is the impression I wanted to leave.

President Stevens: I have one question which I should like to ask on this subject, and that is about the ordinary farmer who has a few acres of land—of this waste land which you speak of. What kind of trees would you plant those few acres to to make them the most remunerative in the fewest number of years?

Professor Freeman: That would be a good deal like the directions on Perry Davis' Pain Killer. I could not prescribe for a forest unless I should know the kind of soil, the drainage and similar conditions there. One kind of ground is not good for everything. Locusts and catalpas are the principal trees planted by farmers. Do not make the mistake of planting these trees on a hard, clay soil. If you have a broken, sandy or gravel tract of land, plant the trees and you will be rewarded well, but if your soil is a heavy clay soil you will regret it. Does that answer your question?

President Stevens: You say, "If you have a hard, clay soil." What do you mean by that?

Professor Freeman: I mean a hard clay soil.

President Stevens: Land like we have on some of our hills?

Professor Freeman: Yes, sir. You can plant a hickory or an ash on the hard soil, but do not plant a locust or a catalpa.

President Stevens: Will black locusts do well in a gravel, sandy soil with a hard soil underneath?

Professor Freeman: Yes, sir.

President Stevens: I should like to ask if the soil has anything to do with the disease on the black locust trees, and if they will be attacked by borers.

Professor Freeman: The borers will never attack a black locust as long as it is thrifty and keeps on growing, but as soon as it ceases growing they will attack it, and they attack them in a clay soil because they stop growing sooner, and are not as thrifty.

Mr. Snodgrass: I have in mind instances where they affect locusts grown in good soils. I know that we farmers in central Indiana have faith in black soil, and I know in our county locusts will not grow

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on black soil because the worms eat them up. Now, I don't believe that rule will hold good. I believe they are liable to attack trees on any kind of soil. They attack them on our soil and we can not grow them on that account.

Professor Freeman: Where is your soil located?

Mr. Snodgrass: In Clinton County.

Professor Freeman: Is it black muck?

Mr. Snodgrass: No; it is good soil that will raise splendid crops of corn.

Dr. Wolfe: I have no doubt that the theories presented here are correct, but it is a fact that I planted catalpa seed on soil seven years ago of just the kind that you have said here would not produce a good catalpa, but those catalpas today are large enough for fence posts and they are doing fine. The soil is heavy clay, running into soapstone and shale.

Professor Freeman: There might be exceptions.

Dr. Wolfe: Yes; I think there are exceptions to the rule. I was raised on a farm which was composed of heavy clay soil and there were locust trees standing on one field of about seven acres that were growing tall, straight and beautiful. This was in southern Indiana, Floyd County. I remember that these trees grew to be two feet in diameter with tremendous limbs, and they stood for years and years without a sign of borer. This was on this same kind of land. My friend over there has some locust trees on just this kind of land that I have described, and they are doing well.

Professor Freeman: You will find these things true on sloping land.

Mr. Work: Is not our red clay the home of the locust?

Professor Freeman: Yes. We find this along southern Indiana, Ohio, Pennsylvania, and following the line of the Ohio River.

Mr. Work: I expect I could cut ten thousand posts today off of my farm.

Mr. Hanger: A part of my land is limestone and a part freestone, and there the locusts grow on either side, or upon both of these kinds of land and I can not see that there is any difference. It is rolling and a little inclined to gravel, and the limestone part is heavy, tough lime-

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stone. This land is covered with locusts. Many years ago they were cut for posts until there is a tremendous forest of them now. Two years ago I cut sprouts from the stumps as thick as my arm, and in two years more they will be large enough for fence posts. I have a long row of catalpa (specioso) in front of my house, but they caused me so much grubbing that I cut them off and will make fence posts out of them. In about twelve years I think they were something like sixteen inches in diameter. They were only as thick as my thumb when I placed them out. The locust grows the fastest and seems the most durable for timber for posts. This is true where I live—down close to New Albany.

Mr. Snodgrass: I should like to ask a question that will be of importance to the meeting. Secretary Freeman visited the fair at St. Louis and was in the forestry building there, and I should like to know what was decided as to the most durable timber at the exposition. I believe it would be of interest to this meeting to have this brought out.

Professor Freeman: I am not able to say.

President Stevens: In the absence of W. J. Ritterskamp, we will take up the next topic, "Selecting Strawberry Plants, Preparing and Setting Them," by W. H. Henry, of Laporte, Indiana.

SELECTING, PREPARING AND SETTING STRAWBERRY PLANTS.

H. W. HENRY, LAPORTE, IND.

Mr. Henry: Mr. President, Ladies and Gentlemen—I must say that I have not felt as much at home for thirty years as I have here today. The surroundings here are like they were where I was raised. The dinner I had today was like the one that mother used to get, and I wish to say also that I don't believe there is another town in the State that turns out another audience like this one. I can not account for this in any other way except for the name of the town being Henryville, named after the illustrious Patrick Henry, of whom we are all proud who carry that name.

We are making quite a drop from forest trees down to strawberry plants. One is necessary and so is the other. The subject which I have to discuss this afternoon is the selecting of strawberry plants, preparing and setting them.

The importance of starting right is a paramount question. As a

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tree or plant is set, so will it grow. I heard Professor Edward Brooks, now superintendent of the Philadelphia, Pa., city schools, once say: "Give me the training of the child until he is seven years old and I care not who has him after that; he will not go wrong." First principles are the foundation of all success, whether it be in fruit growing or any other line of business. In fruit growing there can be no promise of success unless the right start is made. If you have not made the right selection of varieties and pure and healthy stock, planted in the right kind of soil, and amidst surroundings which are congenial to growth, you have taken the first step that many have taken before you on the road to failure. My subject is "Selecting and Planting Strawberry Plants." By the methods practiced a great many growers would think the discussion of this subject unnecessary. One of the oldest and at one time claimed to be the best strawberry growers in the country advocated and practiced the setting of old plants, the older the better. She practiced this until she actually run out, like planting the little potatoes or the tip ends of corn. She came to my place a few years ago and said, "I have got to start new; I am run out. I see my methods in the end were wrong."

In selecting plants for a new bed great care should be taken to get new, healthy, vigorous plants. Plants should only be used from a new bed, and they should be the largest and finest to be had.

Plants should not be taken from the alleys and sides of the row as practiced by a great many growers so as not to spoil the row for fruiting. If you are using plants from your own beds take up the whole row and then select out the very best. The first plants made are the best for resetting.

Do not be deceived by so-called "pedigree plants." They are like patent medicines—made to sell—and you have just as good ones in your own new beds. It is like all other jokes, I think. It has had its day. I believe that nurserymen or plant growers, and that leading fruit growers of the country are as intelligent and have the interest of their business at heart as much as any other class of men and are not slow to develop and put into practice any methods that are calculated to benefit their calling and advance the fruit interests of the country. And for the reason that ninety-nine per cent. of them have not adopted the "pedigree plant" humbug is pretty good evidence that there is nothing in it but a scheme to sell plants at a high price. Hundreds of tests have been made by nurserymen and fruit growers with these so-called "pedigree plants," until it has kept the pedigree man busy supplying the demands of the curiosity of the people. During the past two years I have been interested in an experiment with plants from Missouri, New

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York, New Jersey, Michigan and Indiana, along with what was supposed to be the highest degree of pedigrees. Under conditions that were exact and favorable to all of the contestants the so-called "pedigrees" were next to the poorest on the list of growth, fruitage and all things that go to make up a first-class fruit bed. Plants should be dug the same day you set them. They should be cleaned of all old runners and leaves and roots trimmed and wet or puddled just before setting. Plants should be set as early in the season as it is possible to get the ground ready. Plants set in a dormant state make the best and surest growth. All berry or blossom stems should be cut off, as plants that do not have to mature berries will send out runners long before those that do. Experiment and see.

The second part of this subject is setting the plants. And before you can set any plant you must get your ground in good condition. Do not plow your ground when wet. Plow deep and harrow well, and plank until the soil is in fine condition, as a poor plant set in good soil will do better than the best plant set in poor soil. A plant's environment is the only sure road to a good crop of berries. For the common hedge-row method of growing, which is the only practical method of growing berries for the market, the rows should be set about three feet apart and the plant in the row from eighteen inches to two feet. I set three feet eight inches and eighteen inches in the row and three rows of a variety together, and then the next three rows are four feet; that is, four feet middles between the varieties. I begin a field with perfect blossoms and alternate to the other side with perfect and imperfect, and end with perfect. There are two methods used for putting the plants into the ground. One with a spade or stick, called the "lazy man's method," of hanging the plants in the ground; the other is the fruit growers' method of setting strawberry plants, and is done with a setting trowel. By the spade or long stick method a man takes a spade and makes a hole for the plant by pushing the spade into the ground to a depth of five or six inches, then giving it a side movement two or three times, or as many times as is necessary, to compress the earth to the sides of the hole, or smear it over so it will hold up until the boy has placed the plant in the hole out of which the spade came—if he can find such a hole. If the soil is in the right condition it is hard to determine where the hole was made, but if the dirt is wet enough to hold to the sides until the boy gets the plant in, then the man with the spade is supposed to press the dirt around the neck of the plant with his boot and hold it there until a hard rain comes and starts the plant to growing. A common spade is about eight inches wide, and a plant is one-fourth inch, leaving a space of three and three-fourths inches, or an air chamber something like this:

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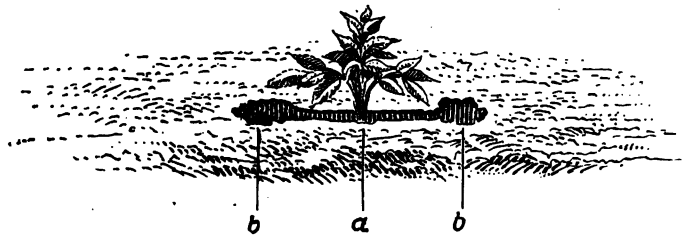

a. Plant. bb. Ends of holes made by spade, not filled with earth.

The plant is simply hung in the hole in the ground.

You can buy berries from men who have practiced this method of setting for about sixty cents per crate, or if he happens to be a plant man, for about one dollar per thousand, as this is a sure criterion of the manner in which he takes care of his berry field. A man that is too lazy to get down and set a plant as it should be set is too lazy or careless to grow a good crop of berries or plants.

The second and only method to set a plant is to set it. This can only be done with a setting trowel. I acknowledge that it is pretty hard work to get down on all fours and do good work, especially if you have from five to ten acres to set each spring, but it is the only way that pays in the end. I tried the spade and also plant-setting machine, both hand and horse, but all are failures. I use a setting trowel made by a blacksmith out of good steel. The handle is about six inches and the blade seven and one-half inches. Keep it bright and sharp at the rounded edges. They cost thirty-five cents each. You can buy a cheap affair for ten cents, or three for twenty-five cents, that will do all ordinary work. I also use a galvanized setting basket to hold the plants, made like a one-fifth peach basket with the end cut out, that will hold from two hundred to three hundred plants. A man with an outfit like this and plants all ready to set can set one-half an acre per day, and not work extra hard. My men do not object to the work. The plant is set the same as setting a tree or shrub. The hole is dug and the plant is set by one person, the dirt is packed firmly around the roots and some loose dirt is scattered around the plant, at the last moment to cover up the finger marks and keep the dirt from baking. A plant set this way starts immediately to grow. And I am free to say that anyone that can see my plant fields and compare them to the spade-set plants will not hesitate to see the difference. If I could get plants set with a spade for nothing and it cost twenty-five dollars per acre to set with a trowel, I would willingly pay the money difference. I am not a very old strawberry grower, only eleven years since I set my first bed of strawberries in the spring of 1894. If you remember, that was that dry, cold spring, when everything that did not freeze up dried up. I

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was raised in a tobacco field on the banks of the Susquehanna among the Allegheny Mountains of Pennsylvania, and it was here among the rocks I took my first lessons in setting and taking care of plants, and those lessons of adversity have stood by me ever since. I have been trying to improve on them each year, and each year I see the good effects of better cultivation. The first spring I set out strawberry plants was 1894. The ground was very dry. I set with a trowel and watered as I set. While I was going to all this trouble an old strawberry grower came along and said: "Henry, you are going to lots of trouble. I set two or three acres in the last two or three days with a spade and a boy, and I know they will be all right, for I have been in the business too long to make a mistake." I knew he was one of those "small fries" and a poor example to take lessons from, but all I said was, "Ahem." Three weeks after that he came to my place again, or rather he met me in the road, and said: "Henry, how are those strawberries?" I said, "Come and see." Mine were doing fine, not a plant missing. I said, "How are yours?" He replied, "I plowed them up yesterday and planted the ground to cucumbers." I never have had any use for the spade since. In fact, I have seen too many failures that can be attributed to poor setting. I know of one man at Chesterton, Indiana, that lost five acres, thirty-five thousand plants, by spade setting. If a customer of mine sets his plants with a spade, a spud or a stick and they fail to grow I do not want him to attribute it to any false teaching of mine. I know it is hard work to get down and set a plant, but it is the best paying investment in the strawberry field.

In all methods of setting great care must be taken not to get the plant too deep or too shallow. Do not cover the crown or let it stick too far out of the ground, but keep it even with the surface. Begin to cultivate with a fine-toothed cultivator the next day after setting, and hoe as soon as possible so as to put fresh dirt around the plants and uncover any crowns that are too deep. Keep up cultivation and hoeing until it freezes and then give them a good coat of mulch, then trust to God for the balance, and He will, I assure you, reward your efforts with berries that will capture and hold any market you desire to put them in at from one-half to one-third more per quart than the spade man can get. If such varieties as Warfield, Dunlap and Excelsior and those of that type make too many plants in the hedge-row, take an iron garden rake and give them a good raking right across the row in the month of October.

Mr. Snodgrass: I remember in the spring, Mr. Henry wrote an article which was published in the Farmers' Guide in regard to the setting of strawberries with the spade, and I do not wish Mr. Henry

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to believe that I am an advocate of setting berries with the spade altogether, but I want to tell you this, that the spade is all right in the hands of a man that will do his work in a good workman-like manner, and the dibble would be a failure in the hands of some workmen. I wrote a reply to what Mr. Henry had written, in the Indiana Farmer, I believe it was; anyway, I wrote a reply to it, and I got it all done but just finishing it, but I never finished it, and I guess it was a good thing that it was never finished, for I said some pretty hard things in regard to that paper. I use a spade, and I do not have any of my plants to die, because I do my work thoroughly. This spring I set about two acres of plants with the spade, and some of them died, but these were the ones that I did not plant myself. I found that when I left the men they did not do the work carefully like I did it myself. I find that there is not so much difference in the kind of a tool that is used if it is used properly. I do not know whether you can get along faster with a spade or with a trowel. I wish to impress this on everyone, that strawberry plants should be set carefully. No other plants require the attention that strawberries do. If you get them too deep they will die and if they are not deep enough they will die, or, in other words, they must be set just right. I wish to say that I think the speaker was too hard on the man that uses the spade. The spade is one of the best all-around tools on the market if it is not set up in the shade and allowed to sit there.

Mr. Garretson: I will have to give Mr. Henry another dip with the spade. I think the spade is the only thing to set out strawberry plants with. I have my ground in perfect order, then push the spade into the ground about four inches, then draw the handle back to me just a little and tip the point forward and then push the spade forward, and this will leave an opening of about two or three inches, and then have a little boy, or a little girl, which is better, to pick the plant out of the water and put it in the opening beside the spade with their finger on the crown and their thumb resting on the ground, so you have your plant set exactly. After the dirt is put back I take my heel and stamp it in place. I should like to tell Mr. Henry if he should come along and find a plant hanging in the ground or the hole in the ground and tries to take it out he will have to pull. I am glad everybody is not alike, for if they were they would all want my wife. I like to get the plants from the side of my row, but I like to get the plants with the best roots. I have also found out that the plants planted in a hedge row about eight or nine inches apart yield more berries than those in a wider row. I go over my patch to know where the best

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berries are. Of course we must differ as we go along in this world, for if we did not, as I said before, everyone would want my wife.

Mr. Kingsbury: I want to endorse this idea of setting strawberry plants with the spade. We have set a good many plants ourselves. I want to say that the trouble with Mr. Henry seems to be the size of his foot more than anything else. If he did not have such a narrow foot he would be all right. He needs to widen his foot; that is all.

Dr. Wolfe: I am not a strawberry grower and therefore I ought to keep still while this discussion is going on, but my turn will come tomorrow to talk and I know that there will be some statements which I make which will cause you to jump on me with both feet. Anyway, Burton, Hobbs and Stevens will, and I want to begin now by jumping on my friend Henry with my two feet, and perhaps we will be even by the time we get through with the discussion.

If I understand Mr. Henry correctly, he said that the breeding of strawberry plants was a fraud. Is that correct, Mr. Henry?

Mr. Henry: I did not say anythiug about the principle of breeding strawberry plants. I only spoke of pedigreed plants.

Dr. Wolfe: Of course we have to breed plants to pedigree them. Now, it is a fact that you are ready to say that there is no such a thing as a pedigreed plant. Is it not possible to breed strawberry plants and make them pedigreed as well as it is to breed stock or corn and make them pedigreed? Isn't it possible to pedigree corn? I used to be a farmer myself and I used to sell pedigreed seed corn to my neighbors. About all the money I ever made in my life was in the practice of medicine, but I think I could make an honest living by pedigreeing seed corn and making cattle pure bloods. I think this gentleman has been quoting Mr. ————, although he did not mention his name. He made his money by breeding strawberry plants. Is it a fact that scrub strawberry plants are the things for people to plant? If I am wrong about this I should like to be put right, and if Mr. Henry is wrong I should like for you to jump on him with two feet.

Mr. Millhous: A few years ago I planted the finest lot of strawberry plants you ever saw, and they were pedigreed plants, but I got the worst mixed-up mess of berries you ever saw in your life, and I have set hundreds of thousands, I guess. Now, in regard to planting berries with a spade or a trowel. I guess either method is all right provided it is done right. Some one spoke of leaving an air chamber by this plan, but this need not be. You must place the spade at an

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angle and fill the hole full of dirt, and then place your foot where the hole was made with the spade the last time. Then you will have no air chamber running about it. So far as I am concerned I do not have enough patience to plant berries with a spade. It is to me like eating soup with a fork. I can plant three with a good trowel like I use where you can plant one with a spade, and I know I can do it as good.

President Stevens: You did not answer the question. He wants to know something about whether or not there is anything in pedigreed plants or not.

Mr. Millhous: There is a whole lot of money.

President Stevens: Because you were bit in them does not convince you that there is nothing in them, does it? Do you think it is possible to produce a pedigreed strawberry plant?

Mr. Millhous: No, sir; I do not. I do not believe there is such a thing as a pedigreed strawberry plant.

Mr. Garretson: I should like to speak in regard to pedigreed plants. You can not change the Warfield or Dunlap or any of those berries. That is my understanding of it. When you try to change it it is always the same kind of a berry, and I think the best thing we can do is to get the best plant we can get of the kind we want. I like the Warfield and Dunlap. I do not think anyone can do better than to set out the best plants they can get. You may keep buying them all the time, but you still continue to buy the Warfield; it is nothing else. With stock you change blood all the time, but not with a strawberry, so I don't see any use in a pedigreed plant.

President Stevens: Can't a strawberry be selected the same as we have built up our corn? Can't a strawberry grower by selecting the best and continuing to select the best build up and improve his plants and berries?

Mr. Garretson: Yes, sir; but he can not pedigree them. You have to go back to the seed to get the pedigree. Of course you can improve these plants by selecting the best plants all the time; I always take care to get the best plants. I would not get better berries very fast if I didn't.

President Stevens: Isn't that the way we get our seed corn?

Mr. Garretson: You go back to the seed with that. When you go back to the seed with a strawberry you will not have a Warfield plant. It is not a pedigreed plant.

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Mr. Burton: I did not intend to say anything on this question, but I should like to say a few words on this pedigree question. I am surprised that one so able as Dr. Wolfe should think as he does on this question, and would not recognize a pedigreed plant. You can not pedigree just one animal or one plant. There must be a new creation before you can pedigree anything. This talk about pedigreeing plants by selection is all nonsense. I do not believe you can do it. So far as I am concerned I think they all contradict their own statements. You can not pedigree without a new creation. When you plant corn you make a new creation, and that is subject to a continual change, and you may get something better or something worse.

President Stevens: You do not cross, do you?

Mr. Burton: You may if you like.

Dr. Wolfe: Where did the first Warfield come from?

Mr. Burton: From the seed.

Dr. Wolfe: Was that pedigreed?

Mr. Burton: No. There was but one seed that produced a Warfield, and it has been a Warfield ever since, and they are the products of that first Warfield. It had no pedigree. I do not believe you could change them materially. A Ben Davis will be a Ben Davis, and you may select them all over the country, but when you bring your selections together and put them under the same environments you will have the same Ben Davis apple, and you will have the same Warfield strawberry, or the same anything else that has not had a new creation. The multiplication of a strawberry plant is not a new creation. It is merely the extension of the one, but you might make an improvement. When the environments are the same the creation will be the same. We have not followed this out far enough in the experimental orchard to declare these things positively, but the indications are that there is no variation in individual varieties.

Mr. Henry: I believe that you understood me to say in my remarks that I believed in the selecting of strawberry plants, that is, to plant the best you have, and I do believe in that. I believe you can get a better strain if you will take the largest and strongest and healthiest plants that you have than if you take the smaller plants. I know in setting out the best I do not set out one plant in ten as they are generally found in the bed of such varieties as the Dunlap, Warfield, Excelsior, etc., for I always like to sort them down. There are some varieties, like the Clyde, that I do not select down so closely.

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Now, in setting with a spade, the spade may be all right in the hands of Mr. Garretson, or a man who does his own work, and does it carefully, but put the spade in the hands of a green hand and see what he will do. What are you going to do when a man hires all his work done and can not be there to see that it is done right? As I said before, if you put the spade in the hands of a good man it is all right, but if you do not you will make an entire failure out of your strawberry bed. If you put a trowel or dipple in his hands you can not help but have them set rightly. If he has this tool he can not do anything else but plant them right. As far as speed is concerned, I can beat anyone with a trowel. I can set three to one with the dipple. Of course it will be harder work, and at the end of the day I will be tired—much more tired than you will be, but my plants will be set out better. That is the reason I do not want my plants set out with a spade—because in the hands of a careless man or a green hand you will make a mistake every time.

Mr. Hobbs: I think Mr. Burton and Mr. Garretson were right in regard to pedigreed plants.

President Stevens: We will now have a brief talk by Professor W. A. Bell before the exercises of the afternoon close.

Professor Bell: You notice that he made it very emphatic that my talk would be brief. He thought that he would make me make a short speech, but we will see about that. In the good old times we used to have preachers to preach sermons, and if there were no preachers someone would exhort. The preacher would preach a long sermon and then the other fellow would get up and exhort for that much longer. In the slavery days down in Kentucky there was a man to preach and another to exhort, and the men up here north began to think they were not doing much good, and were doing more harm than good, and they called one of the natives to them and told him to tell this preacher that they wanted him to stay away, for they would preach and then the negroes would not be any account for a week, but this negro said, "Why, massa, he is no preacher." "What, he is no preacher?" "No, he is just a zorter." "Well, what is the difference between a preacher and a zorter?" "Well, the preacher has a text and he goes back to his text, and has a firstly, and secondly and thirdly and fourthly, and sometimes it goes as far as twenty-firstly, and then goes back to his text all the time, but the zorter just roams." Now, I am just going to roam, for it is so much easier, you know, than when you have a text. This is just the same as talking about a subject when you do not know much about it.

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because if you know about a subject the facts limit you in your oratory, and if you do not know any facts you are not confined—you can say whatever you please and it all goes. We are here to learn from experienced people, and you see what kind of teaching they give us. The Bible says that "Experience is a dear school, but fools can learn at no other." Isn't that the Bible? Anyhow, are we (the audience) of the class referred to who are so hard to learn? The speakers imagine we are.

I will say this in conclusion that we want to get all the new ideas that we can and use them in the best way we can, and when we start out we want to persevere. Most people do not work at a thing long enough to make a success of it; they are too easily discouraged. There are two classes of people in this world—the optimist and the pessimist. One always sees the dark side of life, and the other the bright side. We must see the bright side of life, and especially in strawberry raising, or we will never be successful.

President Stevens: We have heard Professor Bell "roam" this morning, tonight we will have him take a text.

The convention will now stand adjourned until 7:30 this evening. Tomorrow morning's session will convene at 9:00.

(The meeting then stood adjourned.)

WEDNESDAY EVENING SESSION.

President Stevens: The meeting will now please come to order. The first thing this evening will be a selection by the orchestra.

(Music by the orchestra.)

President Stevens: We will now be favored by a selection by the Henryville octette.

(Singing by the octette.)

President Stevens: Dr. Stone, president of Purdue University, who was to have been with us this afternoon, notifies us that he has been called to New York and can not possibly be with us. He stated in his letter that he regretted this very much, as he is not the kind that believes in deceiving the people, and would not if it were avoidable.

We have with us this evening Professor Hollister, professor of agriculture at the Winona Assembly, who will give us "Thirty Years of Fruit Growing" in twenty minutes. We will now hear the professor.

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THIRTY YEARS' OBSERVATION OF FRUIT GROWING IN TWENTY MINUTES.

PROF. E. J. HOLLISTER, WINONA ASSEMBLY, IND.

Professor Hollister: Mr. President and Friends—It seems to me that I have a very large contract on my hands to put thirty years in twenty minutes, and also catch a train at the same time. I find that I am very much like the Irishman, for I can not talk to you with as much vim as I would like to, but the Irishman said, "Stand up for your native land whether you are born in the country or not." So it is my intention to stand up for Indiana, although I was not born in this State.

I have been very much impressed with what I have seen and heard since I came to Henryville, and it has caused me to give considerable thought to the question of the cheap lands. There are the greatest prospects here which I have heard of, but I wish to speak of them further on.

The first interest I took in fruit was in Canada by the banks of the Saint Lawrence River. We used to go to the river, I remember, and gather what we used to call the Early Joe apple. I do not know whether there is such a thing as that now or not. We used to cut switches off of the trees, stick them through the apples, and stand on the banks and throw these apples into the steamers that would pass by just to see the passengers scramble for them. We had plenty of time to do this, for we could see the boat for a mile.

After that I went to Eastern Canada, over to Montreal, and made the acquaintance of the Fameuse apple, which was very fine, and commanded a high price. I have seen it sell for seven dollars a barrel in New York City, when other fruit was not worth over four. They have a soil there which is clay, sand and gravel, which is better for that apple, and I have known of lots of money made by shipping these apples to New York City. I think it was Abraham Lincoln who said, "You can fool some of the people some of the time, and all of the people some of the time, but you can't fool all of the people all of the time." People will buy nice looking apples whether they are good or not for a time, but they won't do it all the time. On Long Island, near New York City, they raise large quantities of apples. This island is about thirteen miles wide and one hundred and fifteen miles long. A number of people have gone out from New York City and built fine resi-

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dences on this island. I know one place of about three hundred acres that is nothing but a park. So the men that are living there are not thinking so much of raising apples as they are of someone coming along to buy them out. This land, within seventy-five miles of four millions of people, can be bought for ten dollars an acre, and there are railroads running very near there. It may be explained in this way—it is covered with such dense timber that they do not care to dig the stumps out. They are raising potatoes there, and are raising about two hundred and fifty bushels to the acre; they also raise cauliflower. This business is so important that they run a cauliflower special daily during the season, which lasts about sixty days; they send about thirty-five refrigerator cars. The potato special is equally as heavy, although it takes but ordinary cars to carry them. They also raise asparagus. The soil there is not very rich—not like the soil here. I know, for I lived there for several years. I know one community that paid seventy-five thousand dollars for a commercial fertilizer during one year. It shows what thoughtful people will do, taking advantage of an opportunity. They have to have the fertilizer, and they buy it and raise crops and make money. Some of the soils around there are not rich enough to grow timber on, because I have been over this territory pretty well, and this is the reason they have started to raising vegetables. Now, how are they to raise vegetables on land that will not grow timber? They had to resort to chemical fertilizers. I am not advertising commercial fertilizers by any means, but I want to bring before you the idea that it is necessary to take advantage of an opportunity to make money. As the Declaration of Independence says in the preamble, "In the pursuit of happiness—in the pursuit of life and happiness." The dollar is at the back of it. If we can use our knowledge to get the rewards which are waiting for us then we have fulfilled our purpose and have used the talents which were given us, and when we are called to give an account of the stewardship we will not say that we wrapped them up in a napkin for fear they might be lost. These people raise very fine apples. They tried to raise peaches, but they were not a success for lack of potash, although I have seen peach trees that would send out shoots twelve feet long in one year. This is a large story, and I could hardly believe it, but when you come to understand the conditions that brought that growth about it is perfectly easy to believe. The trees were planted in bog land, muck land, and they produce very large trees in four years. The bark and the wood are very soft, and not of a hardy quality. This is brought about by the nitrogen in the bog lands which the decaying vegetation made. This land, unfertilized, will not raise peaches, but they raise very fine peaches when they use potash. Where this has been

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tried they have made a great success, although the trees have been frozen out a number of times. When they have a misfortune you should see what is done by these progressive growers. They saw the trees off within two feet from the ground and commence to fertilize the stumps and work the ground the same as if a frost had not been there, and in three years' time they had a fair crop of fruit off of those stumps. This is a demonstration to me of what can be done with a commercial fertilizer. They have made their fruit superior to the California fruit by the use of chemicals, and although they may not be able to control frosts in some places, still they raise beautiful fruit. The soil is very poor except in small areas in this section. Now, we will go to the far west to where they raise fine apples. They have to irrigate there in some places to raise fruit. The trees there make a very slow growth, because there is not much nitrogen in the air, and it does not rain but two or three times in a year, but they have the snow water from the mountains in the spring of the year and there is ammonia in this and it will make the trees grow. And they are producing fruit there which they sell for $3.50 per bushel in New York; I have paid $3.75 for the Jonathan, which was very smooth and finely colored.

I would not ask any of you to go to either of these places to commence raising fruit. You should not go away from Indiana, for if you do you would make the greatest mistake of your life, although you may read in papers about the fertile Northwest, Kansas, and about Western California, but you can make a California fruit farm in Indiana so far as the climate will permit.

I want to put before you the importance of taking advantage of an opportunity. I have gone into communities where land was worth only eight dollars an acre, and I have seen them raise crops on this land and improve them so in one year they would sell for $30.00. I have been in Ohio and have seen lands that were offered for ten dollars per acre, and looking for a purchaser, that inside of two years were sold for one hundred dollars an acre. Now the opportunities these people had thirty years ago were not any greater than your opportunity today. You are right here near the center of population, with Louisville, Indianapolis, Chicago, and other places where you can ship your fruit and take advantage of the market with a very little cost for transportation. I want you to think of this opportunity. You must remember that all things are possible to him who works. Developing this land enhances its value wonderfully. The science of agriculture is being simplified, and it is easy to improve the conditions of the soil, the physical conditions and the chemical conditions,

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and with the proper selection of plants, with proper care, you can do wonders with this soil.

It is not necessary for us to devote our time to a study of science as it used to be, because there are so many ideas being presented today here and in other places that develop other ideas and make science easy.

Now, go a little further along with the idea of development. I want to say to you that a few years ago I heard a notorious man deliver his lecture on "Acres or Diamonds." He, for an illustration, said that a man would go away from home to find good conditions, when as a matter of fact great opportunities were lying about him all the time. I have taken notice of these things and I find that the more I consider them the more I see and the more able I am to reason out this problem. I have been called upon to take charge of one hundred and twenty-five boys in this State at the Winona Institute. We are trying to educate them, and we are succeeding fairly well, I am glad to say. These boys today are cultivating about forty acres of land; about twenty acres is in garden plot and the other in farm land, and they are selling off of that twenty-five dollars' worth a day, and besides getting the money they are doing the business, keeping the books, and assuming the responsibility. I do not like to have to go into the market to buy produce, but I like to sell it. If we can not raise produce easy enough at Winona it behooves us to go farther south and raise it. You are a month ahead of us down here, and if we raise these productions it would be well for us to come down here.

Now, friends, my time is very nearly up, and there are others to follow me, and I do not wish to take very much of your time. I am very glad to be with you. You must work to improve. I want to say to you, friends, that I am very much interested in the State of Indiana. For ten years Dr. Wiley of the Department of Agriculture, Washington, has been at the head of the division of chemistry. He is an Indiana man, a man who is known throughout the country, one of the ablest chemists. More of such men are in Indiana. You will have to wake up if you keep these men. Japan is making great progress today. In relation to this I would like to say we had a department in Washington which was handled by a fine man, a man who could tell about all kinds of plant diseases, and we paid him only eight hundred dollars a year. Japan gave him three thousand and took him away from us. This happened some six or seven years ago; Japan seizes her opportunities and this is the thing which causes the success of Japan. Now, we must seize and make use of our opportuni-

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ties. And we want more of these men. When you see a boy in your community that takes to anything, agriculture or anything of the kind, or any other trade, encourage him in trying to get an education; if you can place him somewhere where he can get this education, do so quickly; he must understand the scientific branches that are taught, but he doesn't need to go more than two or three years. I implore you to bear this in mind; when you see a boy or girl that desires an education encourage him; if you can not, do not throw anything in his way. I know from experience that you should not discourage a person in what he wants to do.

Now, I think my time is about up, but I want to say to you that I am very glad I have been permitted to be here, and I shall carry away with me very pleasant memories, and I shall think more and more of this proposition, and I want to come back to you and go over this land when I have more time.

I thank you very much for your kind attention, and I hope God will bless you and continue to bless you always.

President Stevens: As we have a crowded program tonight I think it will be best to omit discussion, so we will take up the next subject on the program, which is "Woman in the Home," by Mrs. Stevens.

WOMAN IN THE HOME.

BY MRS. W. W. STEVENS.

Not long since in a popular periodical there appeared an article written by one of our best known and admired authors, entitled "The Young Man in the Home," which should be read by every man in America under one hundred years of age. In this article the young man's place is so clearly defined, his duties so plainly marked out, that the mere joy of treading such a path would surely make life worth the living.

The state thus reached would make an ideal home. Dr. Holmes said that "It is in the little communities called American homes that the hope of America rests." Our past and present have proven that the American home has been in most, if not all respects, ideal, and whether or not we as a nation retain our supremacy depends entirely upon whether our individual homes keep brightly burning the sacred fires of American ideals on the family altar.

The world of men is divided into two almost distinct classes, one

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of which might be called the overchivalrous, the other the unchivalrous. The first named gives the woman all the virtues she should have, all the beauties of mind and manner that he would have in an ideal and seems to expect nothing of her but to live up to this exalted standard. The other class belittle woman and her endeavors, feeling that they are necessary—a necessary evil—and at best are but to be endured. Neither of these ideas should prevail if we are to get all or the best out of life. The woman in the home should not occupy either an exalted or degraded position, but should be the full complement of the man, supplying all things he does not possess, and filling all positions he can not fill, without any thought of which is the more important part, or the most indispensable to the welfare of the family or nation. As they have such different characteristics, such different viewpoints and such different missions in life, the relative importance of man and woman can not be compared at all. One very beautiful writer along this thought has put into the mouth of the Creator the following words: "I am founding the universe. I am creating a wonderful place called Eden. I am going to clothe you each in human form, marvelously, beautifully made, the highest work of my hands. Some of you shall be men. To you men I will give the task of labor in the fields, of warfare with wild beasts; it shall be your duty to subdue the wilderness, to construct and defend a dwelling place for those I am going to make women. Therefore I shall give you men large bones to deal strong blows and strong skulls to withstand the same; I shall give you courage, physical power, audacity and daring. The woman's mission shall be different. It shall be for her to create and preserve human happiness. She shall do this in the dwelling place which the man constructs for her and which shall be called home. There shall she bind up his wounds and give him rest and comfort. I shall give unto her keeping also the making of the race and thus the control of the destinies of the world. And so to this woman shall be given delicate bones and a deft touch, a voice of music, an eye of peace and a heart of tenderness."

The ideal embodied in this man-made language of the Creator has been expected from time immemorial by the major part of mankind of both civilized and uncivilized people, notwithstanding the fact that we do occasionally see a woman whose voice is not music, whose eyes do not beam with tenderness, and who does not care to perpetuate the race, as well as men who are not brave, who positively refuse to build a home and protect a family within. At present there seems to be quite a hue and cry about the instability of American home life, race suicide, divorce evils and many other evils that affect directly and

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vitally the happiness of men, women and children, which if true to the extent that one is led to believe, will soon affect our national life as well.

If to woman has been given the making of the nation and control of the destinies of the world, one is led to wonder if she is living up to her trust as she should. The Creator says this shall be done in the home. It is being done, or is it being done there? The answer depends upon what we understand the word "home" to mean. To me it means a place of my very own, a permanent abiding place from which no landlord can drive me and from which I will never depart unless I feel assured of a better one. To many it used to mean a place in which to eat and sleep, but in this age of progress it means even less, as any place where the family may possibly all sleep, each member of which takes his or her meals whenever and wherever he or she cares to. This state of affairs will surely disrupt any family in time, no matter how deft the touch, how musical the voice or how tender the heart of the woman who is to control its destinies.

To man was given strength to defend his home, but will he be inclined to use this strength with much ardor in defending a flat or rooms, boarding house or hotel, be they ever so nice? Does he put forth the same effort in building up or defending something which is not his own—some other man's property—as he would his own? The answer is "No." We have all noticed how our preachers, speakers and sociologists have become alarmed at what they term the decadence of our home life, but to most of us this has gone in at one ear and out of the other, or if we have stopped to think of it at all have decided that these persons are scared rather than hurt. And really to those of us who live in villages and rural districts there seems to be no cause for fear. Do not we own our homes and do not our friends rest under their own vine and fig tree? But is this true of the majority of people? Let's go to the census taker. He finds that in Boston ninety-two per cent. of the people live in rented houses; in Chicago eighty-nine per cent.; in New York ninety-five per cent.; in San Francisco eighty-five per cent.; in New Orleans eighty-three per cent.; in St. Louis eighty-seven per cent.; in Denver eighty-four per cent., and in Indianapolis eighty-eight per cent.

In no city do anything like half of the people own homes, and most of them are flat or tenement dwellers. Many of those who do own homes are compelled to take roomers or boarders, and thus in a measure destroy the privacy of home life.

To offset this lamentable state of affairs let's look at the table of rural statistics. But what do we see? Figures that are startling.

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We find that in 1880 seventy-four per cent. of our country people lived in their own homes, and tilled their own lands; in 1890 it had fallen to seventy-one per cent.; in 1900 to sixty-four per sent., an accelerated rate which means, if not stopped, that in 1910 not more than one-half of even our country people will live in their own homes. This condition is not confined to the North, South, East or West. Nor is it noticeable to sections particularly affected by immigration; in fact, it is no worse there at all. The general farming, stock raising, grain growing and fruit growing regions are affected in about the same ratio. Nor are these homeless people of any particular class, yet the large proportion of them are the very rich and very poor, the middle class, or good livers, being in this as in all things American bulwarks of defense and showing normal instincts.

If we are to become a nation of nomads whose fault is it? If man is the all-important individual it is his; if woman be the main-spring of human activity it is hers, but if they are equal they must bear equally the shame and blame. In individual cases it may be one or the other. If the man provides as pretentious and comfortable a home as his means will allow and the woman by careless indifference or ignorance does not bind up his wounds and give him rest and comfort therein—in fact, if she does not build a home within this house—she is to blame for anything that may go amiss in her family which comes through the lack of proper home surroundings. But on the other hand, if the man asks a woman to come to him and make a home and gives her rooms with board, a flat, or asks her to do this in someone else's house, without any hope of her own in the future, he is to blame if she grows discouraged, gets careless, lets the children grow up on the street or under the feet of her neighbors and in the end to go to ruin. Again, if by mutual consent they avoid the energy and economy, the care and responsibility necessary to gain and maintain a home, if they decide to sponge their way through life, shirking all responsibility, they are equally to blame for the poverty and failure of their lives and are no better than criminals if their children live worthless parasites on the body politic or fill a criminal or a pauper grave.

Satan finds some mischief still for idle hands to do, and an idle woman is surely the fairest mark for his poisonous darts. The remedy for this would be not to allow her to be idle for long at a time, and if there is a place in this world where a woman can be more profitably busy than in her own home surrounded by a loving and appreciative family, I have never seen it. It is true that many women are better managers, better moneymakers, than many men, and it is equally true that many men are gentler, more painstaking and really more

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domestic than some women are, but these are the exceptions, and to the women we will still look for housekeepers and homemakers and to men as housebuilders and moneymakers.

I wish that every woman in America would stop for half a day—many couldn't stop longer—and after asking themselves the question, "Am I doing all that is in my power to make the home in which I live a perfect one? Am I getting all the good out of life for myself and those whose destinies I am responsible for?" Happy would be the woman who could conscientiously say, "I am," and wise would be the woman who, finding that she was not, would say, "From this time I will." The remainder of the day could be spent in reviewing the past, searching for the most glaring mistakes and planning how quickest and best to correct them. This self-communion would reveal to most of us the fact that we have never appreciated the dignity and importance of our position and work. Down in the bottom of every woman's heart is the desire to do something great in the world, to be somebody, and a secret contempt for housekeeping and child rearing. This is but natural where we see so much of heroine worship. Harriet Beecher Stowe is remembered by the books she wrote, not by the children she gave to the world. Florence Nightingale, the heroine, is known the world over and I question if she spent more sleepless nights in her life or worked harder or with more heart anguish than have thousands of women in caring for their families and of whom no one has thought of as a heroine. It is said that Clara Barton gives her life to the alleviation of pain and misery of her fellow creatures, with scarcely a thought of self. We all know of her greatness, self-sacrifice. We applaud and appreciate her goodness, but in every community one could find women who are just as truly doing this as she, and for her very devotion to her home and invalids, for her very self-sacrifice in order that she may see her children educated she is called a dowdy, is out of society and is considered too unambitious and commonplace for notice.

Now that our deepest thinkers and strongest writers are making such earnest pleas for better homes, and that women are realizing that the making of a real home is the one thing that she can do well and at the same time save her own self-respect and that of the world, her attitude towards herself in the home will change. When a keen enthusiasm takes the place of careless indifference; when she realizes that it is as grand a thing to nurse an old father or mother, a brother or sister, husband or children as to leave these to the tender mercies of the world while she sallies forth to care for strangers; when she decides to educate the little heathen in her own home instead of the heathen

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in darkest Africa—then, and not until then, will our homes improve as they should. If there is a common fault that we women have it is that we spend so much time and labor on non-essentials. We fritter our time away on little things that are not worth the while, and have no time, strength or inclination to do some of the more important ones. For instance, so many women build up a reputation as a famous cook, the finest housekeeper in the country, or the most elaborate sewer ever, and in living up to either of these reputations they lose sight of other or equally important points. I know of women who spend the greater part of their waking hours in the concocting and making of table delicacies and become careless or slovenly housekeepers. Others get a fine collection of wrinkles, a narrow mind, ill temper and ill health in trying to keep their houses immaculate. Some seem to live to add tuck to tuck and ruffle to ruffle to the clothes of themselves and their children or fancy work for the house. The older these "specialists" get, the worse they are until they are no longer homemakers, but household cranks. The one thing these women seem not to see is the unattractiveness of their surroundings. They work themselves into an early grave and never realize what a joy a fine flower garden is. They seem to think that a broom is to use only in the house, when the front yard needs it much worse than the parlor carpet. I have been in many homes where I would have thought better of the hostess if there had been less to eat on the table and fewer old tin cans, broken pots and rusty buckets in her back yard. I know women who have been sitting at the machine for years hemming ruffles when there was not an ornamental tree or shrub on the lawn, a vine on the porch or veranda, or a flower for a vase in the house. Their mission was to cook, not to dispose of the things used up in the cooking; to keep the house clean, not to delve in the dirt of the yard; to beautify their clothes and make centerpieces, and should not be expected to beautify their home grounds nor raise flowers that might on some festive occasion be put upon these precious centerpieces and spoil them. Everyone admires a good cook, a fine housekeeper and an exquisite needlewoman, but there is a loss of respect for them if every other feature of their lives is made subordinate to either of these things. Think what it would mean if every woman was a member of a Beautiful America Club. This club has for its mission the beautifying of the waste places of America. While there is quite a bit of inspiration to be gained in belonging to a club or working in unison with others, yet it is not absolutely necessary to belong to anything in order to make our yards, lawns or roadside beautiful. The first step is to clean thoroughly all unsightly spots. After this the beautifying is easily done. It may be that all that is needed

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is to make of such a place a joy forever is to cover the soil with a fine green sward which can be kept in shape with a lawn mower. If the ugly spot is near the house a well kept flower garden or even a fine flower bed will redeem it. If the place be large, trees, vines, arbors or perfolas can either or all be used and make an eyesore a magnificent beauty spot. If the woman in the home will accept her lot as the very finest one that any woman of this world can possibly have, if she will so direct her life that no opportunity for doing good, for making those around her happier is lost, she will not only rise to the dignity of her position in her own estimation, but of the entire world, and will then be worthy to wield its destinies.

President Stevens: We will now be favored with a selection by the octette.

(Music by the octette.)

President Stevens: Our program is lengthy tonight, but we will be crowded tomorrow, but the best part is yet to come, so we will have a selection by the orchestra.

(Music by the orchestra.)

President Stevens: The next on the program will be "Southern Indiana as a Place to Live and Make a Home," by Freeman Cooper.

President Stevens: It was announced this morning that Professor Bell would take a text and give us a regular sermon this evening. Now the professor can do just as he pleases—he can take his text or he can roam again.

Mr. Bell: You notice he didn't leave it to a vote of the audience. I should like to say something about the paper which we listened to this evening. You know I am great on talking about women. I like them pretty well. This was the best paper that I have heard since I've been down here. It had a great many good things in it. I think a woman is a good thing in the home. A home is a pretty poor sort of a place without a woman in it. I know this because Mrs. Bell has been in New York for a month, and I have found it out thoroughly. Now, according to the paper, the home is a sort of a mutual arrangement, and the woman really has something to do with it, and if she does her part she ought to be counted a full partner. I think this is fair. The women will understand this, but the men may not. This part of the talk is for men only. Suppose two men should go into busi-

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ness together, and one of the men should travel and the other should stay in the store or office, or factory, whatever it might be, but he would do just as faithful work as the first man, and probably devote more hours to it. But suppose that the business is such that the money happens to come into the hands of the fellow who does the traveling, and suppose he should say to the other partner, the man who is doing just as much as he is, "Well, this money is not yours; it is mine; and if you want any you have got to ask me about it." What would the fellow in the shop do? He would very likely say: "It is half mine; I work for it; and I'll have it without asking you for it." Look at the home. The woman is working just as many hours as the man, and as faithfully, and is as essential, and they are both working for the family, and I do not see why a man should require his wife to ask him for money just because it comes into his hands. I have oftentimes thought of the Quaker who, when asked for some money by his faithful wife, said, "Mary, what did thee do with the dime I gave thee last week?" My theory about it is that a woman should not be compelled to ask for money nor to give an account of every penny she spends unless the man also gives an account of what he spends. I know a great many families where it would be better if the financial affairs were in the hands of the wife, for as soon as the man draws his salary he goes off and spends it for drink, when his wife and children are at home suffering for the necessities of life. A woman should have a certain part of the money and it should be considered "our" money instead of "my" money.

President Stevens: We have with us a man—Mr. Work of New Washington, Indiana—who wishes to tell us some historical facts.

(Paper not furnished Secretary for publication.)

President Stevens: We will now have some music by the orchestra.

(Music by orchestra.)

President Stevens: I think this closes our program for this evening. I would say that all those who wish to go on the trip tomorrow to look over the Reservation will kindly be here at 6:30. There will be ways provided for you to go.

You may consider yourselves dismissed until tomorrow morning at 9:00.

(Meeting stood adjourned.)

(The forenoon was spent at the Forest Reservation and no session was held.)

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THURSDAY AFTERNOON SESSION.

President Stevens: The meeting will now please come to order. While we are getting ready to start we will have the report of some of the committees. The first will be the report of the Committee on Awards.

Secretary Flick: (Reads)—

Collection of Pears—W. S. Ratliff, Richmond, first, $2.00.

Collection of Plums—J. J. Milhous, Valley Mills, first, $2.00.

Collection of Garden Vegetables.—J. J. Milhous, Valley Mills, first, $2.00; F. J. Huffman, Henryville, second, $1.00.

Collection Cut Flowers.—J. J. Milhous, Valley Mills, first, $2.00; E. Y. Teas, Centerville, second, $1.00; E. Y. Teas, Centerville, third, 50 cents.

Collection of Fruit by Boy or Girl—Arthur F. Litt, Crothersville, first, $2.00; Verlin Ratliff, Richmond, second, $1.00.

Collection of Raspberries.—Amos Garretson, Pendleton, first, $2.00.

Joe A. Burton exhibited a large number of apples, among them being many seedlings from the Experimental Orchard at Mitchell, Ind.

E. Y. Teas, Centerville, Indiana, had a fine collection of dahlias and gladiolas.

Dr. J. W. Bates, Broad Ripple, Ind., and A. W. Shoemaker, Daleville, each had nice plates of fine plums.

AMOS GARRETSON,
W. A. BELL,
E. Y. TEAS,
Committee on Awards.

Mr. Millhous: I move that the report be adopted.

The motion was seconded, voted on and carried.

President Stevens: Is the Committee on Resolutions ready to report?

Mr. Hobbs: Resolved, That the thanks of this society are due W. H. Freeman, Secretary of the State Board of Forestry, for his invitation to hold our summer meeting at Henryville and the State Forestry Reservation, and for his thoughtful and ample provision for our comfort and entertainment;

Resolved, That we also extend our thanks to the citizens of Henryville and vicinity for their hearty welcome and generous hospitality.

MRS. AMOS GARRETSON.
C. M. HOBBS,
A. W. SHOEMAKER.

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Mr. Henry: I move that the report of the committee be adopted.

Seconded, voted on and carried.

President Stevens: If there is nothing on the Secretary's table I suppose we might take up the regular program for this afternoon. The question of "The Best and Most Economical Way to Fertilize Southern Indiana Soils for Successful Fruit Growing" was assigned to Dr. Wolfe, who was called home this morning, but his paper will appear in the printed report. (See page 77.) I believe that the State Forestry Reservation was inspected this morning and the demonstration of "How to Spray and Prune" was prevented by rain.

Secretary Flick: The apparatus was all here this morning for the work in the orchard, but on account of the inclemency of the weather it was postponed and will have to be done at some future time. To the citizens of the community I would say, when you are ready, if you will notify me I will try if I can have someone who is well qualified to come down and give this demonstration work.

President Stevens: We have with us this afternoon Mr. James L. Keach, commission merchant of Indianapolis, who will talk to us on "The Proper Care and Handling of Fruit for Market."

Mr. Keach: In preparing this I had in mind the packages used for sending berries to market from this section of the State, and they are about the same as they were twenty or twenty-five years ago. Possibly my talk will give you some hints as to the changes that should be made in that direction.

In handling fruit for its commercial value, select hardy varieties that stand shipping; grow enough of each variety to justify proper cultivation, and never put off until tomorrow what can be done today. The eye being the father of the appetite, cleanliness is all important. Pack fruit in a new, clean, attractive package. I am an advocate of full measure, for, considering the question from the lowest moral point of view, that of "honesty is the best policy," I am prepared to say that a well-filled standard measure, whether it be a quart or a barrel, sells first, sells at the highest price, sells in a glutted market, sells at a premium far above the difference in quantity. I have never known a locality adopt a full-size package that ever went back to the one and one-half pint box or ten-peck barrel.

There is a well developed prejudice in the minds of the American people that is opposed to "fake" in any form, whether it be a fake berry box of one and one-half pints, a ten-peck barrel or a three-fourths bushel box—in fact, grafting in any form.

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The berry market is demoralized every year, due to picking and forwarding berries half ripe, in poorly filled short quart boxes, until the trade refuses longer to be imposed on. You may fool the customer once, and that is your fault, but if you fool him the second time you will understand that is his fault; when a market has been once broken, through sharp practice, it requires continued low prices and improved quality to restore confidence, and the shipper pays the price of his folly.

The prejudice against fake of any kind makes it to the interest of the shipper to pack all fruit honestly and fill all packages full. Fruit should show not to exceed ten per cent. better quality on the top or face of a package than the contents below. Nothing should be sent to market that you would not buy for your own consumption and pay your money for. Honest picking and packing and honest measure tends to increase consumption, and anything that increases consumption is beneficial to the trade.

Don't pick your fruit until fully matured and colored. Go over your fruit often enough to prevent it becoming overripe, as overripe fruit mixed in a package ruins the condition and sale. All fruit should be graded for quality in packing, and should be packed from packing tables. Growers should organize close, exchange views, appoint committees who will investigate markets, shipping facilities and arrange all details in advance, advertise your product with the trade, encourage cash buyers to your field, and establish a home market.

Keep in mind what was wrong in former years and try to remedy it. Look after refrigerator service, rates and transit service before your crop begins to move, appoint inspectors who will look after the proper grading of your product and will teach small growers the proper method of packing. I would suggest that you select the more hardy varieties for your heavy crop. If berries, the more Klondyke and Gandys and less Thompsons and Clydes the better. If tree fruit, you must take proper care not only in selecting varieties, but in proper care of the trees, and last but not least keep in mind that Purdue University is at your service, and their experience and advice on fruit culture is the result of much thought and careful experiment.

Secretary Flick: Does it pay to put any but fancy fruits in fancy packages?

Mr. Keach: I think not. It would tend to make the poorer fruits cost too much, and then be out of the reach of the poor families.

Mr. Swaim: What is the difference in cost between the bushel box and the barrel?

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Mr. Keach: One is seventeen or eighteen cents and the other thirty or forty.

Mr. Swaim: Do the boxes have an advantage over the barrels in the matter of cold storage?

Mr. Keach: I do not think they do; in fact, I know they don't.

Mr. Swaim: I should like to ask another question. Is there any advantage in cooling fruit before you ship it?

Mr. Keach: That depends on the distance you are going to ship it. If you are near the market, No; if you are far from the market and have the facilities for cooling the fruit, Yes. Of course, you will have to use refrigerator cars then. This would do well for any fruit of a delicate nature. Berries are much easier bruised when they are hot than when they are cool. Fruit is shipped from Alabama to Indianapolis, and it requires four or five days to do this, yet it arrives here in good shape, and the secret of it is they cultivate their berries, pack them carefully and send nothing to market but the good berries. There must be a uniformity of packing to get good results from the market. For instance, if a man has been sending us berries and they are all alike we can insist on our customers not opening every crate, but if not, what can we say? They will go through and open the crates, so that by the time we have waited on just a few customers the whole number of crates has been opened. If we were sure of ourselves we could say, "Hold on there; those are all right, and you need not mind opening all of them." Suppose in the poorly graded fruit you should not allow a man to open the berries and look at them. When the market is over he is likely to bring them back to you and show them to you and say, "You surely wouldn't want me to take these, would you?" Then what can you do? If you would grade honestly you could establish markets at home just the same as ———— does for his apples. He can get more for his apples right down there at his orchard than we could get for them in Indianapolis. Why? Because of the reputation he has, and the kind of apples he raises. What people want is good fruit.

There is another thing I wish to call your attention to. If you have a good deal of fruit it is very likely that a solicitor will come down to see you in the spring of the year. They are sent out by commission houses, and as a rule they are pretty good, well-informed men. You will not make much of a mistake if you follow their instructions as to packing the fruit, but you may make a mistake in shipping to their house. They as a rule commence in Florida and come through Michigan—they follow the fruit crop up from the outset, and they

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ought to be good educators. I make these suggestions because I have no doubt that these people have visited you at different times in the year. There is no house that will not send one of these men out to interview you, provided your fruit crop is of sufficient importance to warrant it.

The question of packages is also an important one. I am not interested in any box factory, but you know as well as I do that the crates that are put on the market from this section of the country are flimsy affairs. They are the same as they were twenty years ago. You should be careful about the packages that you use.

Joe A. Burton: Can we ship Yellow Transparent apples in good condition in barrels?

Mr. Keach: Yes, if they are packed properly they can be shipped in barrels.

Joe A. Burton: They should not be too ripe?

Mr. Keach: Of course, the question of packing apples in different packages depends largely on the distance you are shipping them and the particular market you are shipping them to.

Mr. Ratliff: What does it cost to keep a barrel of apples in cold storage for a year?

Mr. Keach: I think it costs about thirty-five cents. Of course, it is sometimes more than this; it is according to supply and demand.

I have been asked in regard to different sized packages. You from this section of the country do not, as a rule, use full sized measures, and if some of you do that counts for nothing, for there are too many that don't, and when your basket comes in from this section of the country, the commission merchant does not take the trouble to look and see if your measure is full sized, but takes it for granted that as you are from this section of the country it is not, and therefore you are not allowed anything for it if it is. You should all work together.

A Delegate: Wouldn't it be hard to start a different sized crate in this country?

Mr. Keach: That is a question for you to seriously consider. The time to consider the crate question is before the crop is ripe. In Illinois there is a law that no one can send in a small quart unless he stamps it so. This must go through the hands of an inspector whose duty it is to see that no man's berries pass through in a small measure unless it is plainly stamped "short measure." The law fixes the size

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of the package. I think it would be a good idea for you fruit growers in this section of the country to get together and talk over all of these matters and appoint a committee to look at the different crates and decide what ones you will use; you must be uniform. Now, if you use the full measure it takes a less number of packages to put the same amount of fruit on the market. Ask yourself this question: "Would you not pay more for a full quart than for a short one?" In the case of a glutted market the full quarts are taken first and the others are left. In fact, in my twenty-five years' experience I have never seen what might be called a glutted market on good fruit in full packages. In a good many instances I think this short measure is an intention to cheat, but in many it is simply an oversight. When you ship your fruit be careful that it is packed in the very best possible manner. Do not try to make poor fruit appear good by putting good fruit on the top. Do not put more than ten per cent. better fruit on top than the basket contains the rest of the way through.

A Delegate: Do you think it is advisable to do this at all? Why not put the same kind throughout?

Mr. Keach: Yes, I think it is permissible to put ten per cent. better fruit on top.

A Delegate: How do you justify that?

Mr. Keach: That is only a very slight difference, and I think it is permissible. It adds to the attractiveness of the fruit.

Mr. Garretson: I always tell my pickers in the patch if they find an exceptionally large berry to hide it. I have two grades always.

Professor Troop: From your remarks, I would infer that when berries are sent in in full boxes they bring more than otherwise. This may be a leading question, but do you take into consideration the kind of boxes that come into the market, and do you charge more for a crate of full-sized quarts than for a crate of wine quarts when you sell them?

Mr. Keach: We do. Unless it is like a case I spoke of a short time ago, where almost everyone from one section of the country uses the small-sized and one man uses the full-sized. His may be overlooked.

Professor Troop: Then if you know a box is a full-sized quart you charge more? In the Lafayette market we have all kinds and sizes of boxes during the berry season, coming from different sources, and I never

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knew a retail merchant to make any difference in the price of the boxes. They are all put together.

Mr. Keach: Well, we make a difference. In fact, if there is enough full measure to supply the demand the short quarts will not sell. I like for the people throughout the country to be successful, for their success means mine. I think that if a man who has full quarts would put his name on his packages and write the commission man he would get fair consideration and build up a reputation for good fruit and it would pay him.

Joe A. Burton: Is there any danger of losing your reputation by anyone else using your box after it is empty?

Mr. Keach: Never send your fruit to market in second-hand boxes. If you do, you will have to suffer the consequence. You will not get nearly as good a price.

Mr. Burton: I mean the fellow that gets that box.

Mr. Keach: Well, that is on the crate. If you buy a crate with the name of Stevens on it today, and it is all right, and buy another tomorrow and find it all right, the day after that you will ask for his berries because you have found them all right, but no second-hand crates would be found.

Mr. Millhous: Someone else may get hold of those crates.

Mr. Keach: If someone does it will be late in the season, after the berries are almost gone. Now, the buyers know pretty well where the berries are coming from, and it would be hard to fool them.

Mr. Millhous: I had very fine berries one year and I put my name on the boxes. I found that people got these boxes and went around through town selling the worst kind of berries you ever saw under my name.

Mr. Keach: Well, that kind of people only sell berries one day in a place. They never go over the same route twice.

President Stevens: We will now hear Mr. Burton's paper.

Joe A. Burton: Now, as most of you know, I am an apple man, and when I speak of fruit I mean apples, so please bear that in mind.

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QUALITY VERSUS QUANTITY.

BY JOE A. BURTON.

A five-pound rooster sells for fifteen cents; a two-pound cockerel for twenty-five cents. An old rooster is doubtless as nutritious as a young one, but the demand is very small. Why so? Certainly the old fellow is much more beautiful than the young one. He furnishes nearly three times the meat at one-fourth the price. The people would consume unlimited numbers of the cockerels were they not so high-priced, but if we try to force the old ones on them they substitute something and we lose the market.

It has been said that the American people are rapidly becoming a banana-eating people. All acknowledge that a good apple is better than a banana, but when we continue to thrust the old Ben Davis rooster, or some of his kind, into their basket, do they not have a right to rebel? Did you ever hear an individual discoursing on the good qualities of the banana? They never say "they are just awfully good," like they do about the Grimes. They are palatable. The people want fruit, and in the absence of something better buy them.

Did you ever hear a person discoursing on the good qualities of the Ben Davis? Did you ever have an order for them when you had something better to offer? In all my apple experience I have not had a half dozen orders for this apple, till my desirable kinds were gone, except as a twenty-five cent apple for apple butter. But how about the desirable kinds?

All spring and summer we have been booking orders for Grimes, Rome Beauty and Winesap. All our Genets for this season were more than covered by orders last March. One man commenced negotiations for our entire crop of Grimes before the bloom had fallen. This man went to New York for apples last year, and he got them cheap. Why does he turn to where he knows they will not be cheap? New York grows immense quantities of apples, but what are they? Perhaps a large majority of Baldwins, grown because they are easily grown, in quality a close half-brother of the Ben Davis. Some are Greenings, an apple of uncertain quality. Some are good and some very ungood. They dumped immense quantities of them into Indiana last year. They sold for scarcely enough to pay for loading and dumping. I would suggest to New York, if she wants Indiana to help eat her apples at paying prices, that she grow something good. Hoosiers that have just had

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their fill of Grimes can't be satisfied with something inferior. Illinois and Missouri are infatuated with their Davises; Virginia, with her York Imperial; Indiana can and does grow a few of the very best apples. Why not grow the best exclusively, and more of them? Don't grow something that will stop consumption. Grow something that the people can't help wanting, and if they can get them, can't help eating. If we grow the kinds that do best here, we will grow the kind that the people want, and the market will be ours, no difference how many Davises come from the West, Baldwins and Greenings from the East, or Imperials from the South. We can't afford to grow a low-priced apple now. Labor is high, fruit packing and packages are high. They cost the same for inferior fruit as for good. It is not then necessarily quantity but quality that pays.

Well, suppose the inferior fruit will yield as much profit as the good. Isn't there a pleasure in working with the good things of the world? I love to sell apples that delight the buyer. He is pleased, and I am pleased. We can greatly increase the consumption of fruit if we give the people good fruit.

President Stevens: We will now have "Southern Indiana as a Fruit Growing Country in the Past and Its Future," by Robert Deiterlen.

Mr. Deiterlen: Mr. President, Ladies and Gentlemen—I have run up against something I have never done before, and that is make a speech.

The first thing I want to speak about is the soil of southern Indiana. In this section of the country we have four stratas of soil; the highest is a sandy soil which is adapted to peach growing, the second strata is a soapstone formation which is not adapted to peaches but to apples, and the third strata is a slate formation which is adapted to apples and not to peaches, and the fourth strata is a Niagara limestone strata which is only adapted to apples.

Now, as to setting apples trees in this section. You do not want to set them less than forty feet apart, or peach trees less than twenty feet apart. The cultivation depends upon the depth of your soil and its liability to wash. If the soil is close to the hard pan, and which is very poor, you want to break before planting as deep as you can.

Now, in regard to the dollars and cents that are in this business. That is one of the main points. In my experience apples usually produce more than two hundred and twenty-six bushels, which at ten cents a bushel brings you a net of $26 to the acre. Now, that looks like a paying business to me, and that is figuring the apples very low; they are never sold for that price; never were. If thirty per cent. of

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Monroe township were planted in apples it would give us three hundred thousand bushels of apples, and that at this low price would be thirty thousand dollars. Now, our canning factories here would be glad of the job of handling the excess amount of goods; it would make them run two or three months longer.

I have a peach orchard of nine or ten thousand trees, and I haven't shipped a peach for twelve years. You may think I do not raise any, but I do; I have raised good crops of them, but they are used by the people fifteen and twenty miles around; they come right to the orchard to get them. You ask how this is done. It is done by putting the price so that the different classes of people can get the fruit. I have three times in the last few years put the price of peaches down to twenty-five cents a bushel and made good money out of it, and I never have put them over seventy-five cents. I have had people come ten miles after those peaches. Now, in this country there could be six tons of grapes raised to the acre. In Europe, on the Rhine, they raise as high as twenty-five tons, but in our six tons there is more profit. We want happy homes in this section of the country, and I do not see why at least fifty per cent. of the land in southern Indiana could not and should not be put in fruit. You all know that it is fine for that, and is too thin to raise grain on. Another thing is, you can use the little folks who are too small to use in the grain business, and in this way you can train them to be industrious right from the beginning. Also, it will help the people in the towns, for it would cause the canning factories to run longer and therefore give them employment longer. This would have a tendency to make the entire people energetic and industrious, which is the kind that our government stands for.

I thank you.

Mr. Hobbs: On our way out to the Reservation this morning I noticed, although I must say our vision was somewhat circumscribed by the condition of the atmosphere, that most of the orchard trees seem to be in the last stages of their existence, and I should like for someone here who is informed to give us the reason for this. What is the matter with them?

Mr. Deiterlen: I should like to answer that question by saying that the earth crust of the soil on this strata of soapstone is not sufficiently thick to support these trees without fertilizer, and so has supported them just as long as it can, and they are now dying for the want of food.

Mr. Hobbs: Can you raise apples in that kind of a soil?

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Mr. Deiterlen: Not without feeding the trees. You should have from two to fifteen feet of fertile soil at least.

President Stevens: Have you got it here?

Mr. Deiterlen: Yes, sir; lots of it. Over there on top of the hills we have from fifty to sixty feet of it, and about one hundred and twenty feet of soapstone strata beneath.

Professor Troop: It seems to me that the orchards that Mr. Hobbs spoke of have been gone over by the canker worm. Is that true? That is the way it looked to me. They are trying to put out a second crop of leaves, I should think, but of course this worm injures them very much. They strip them of their leaves early in the season, when the trees should have their leaves in order to protect themselves and produce the amount of growth due them. When you have an orchard of this kind and the worm makes its appearance you should go after it with a spray pump and a solution of paris green and four or five ounces of lime to the barrel. If you will do this you will not have any more trouble with this worm. I want to emphasize the fact that the canker worm or any other kind of a worm that comes on the trees injures them very much because of the fact that the tree cannot do nearly so well deprived of its foliage, and you should not expect it to produce good fruit.

A Delegate: Yes, sir; we have had the worm down here. The apple crop last year was fine, but this year they are all very small and are stung all over. What is the cause of that?

Professor Troop: Some sort of an insect is doing that. Very likely this stripping of the leaves would cause the fruit to be small or the curculio would cause them to be knotty; the small fruit this year comes from the fact that the trees were stripped of their foliage early in the season, and the fruit will not mature.

Mr. Garretson: I will have to disagree with the professor in regard to the quantity of paris green to use for the worm. We put three-fourths of a pound to fifty gallons of water, and put lime with it, and kill the worm, but we could not do it with a small quantity.

Professor Troop: Your paris green must have been very weak.

Marion Finley: I do not agree with what has been said about the soil around here. I do not think the soapstone is any nearer the surface than it was twenty years ago, and we produced good fruit then. The facts are that the orchards have been neglected woefully. I commenced to spray my orchard three years ago and I had the very best

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fruit last year. I raised Yellow Transparents that I shipped to Indianapolis and got $1.50 a basket just as fast as I could get them there, and if people would only spray their orchards with Bordeaux and paris green and then cultivate them they would produce good fruit—just as good as we produced twenty years ago.

Professor Troop: Did you have good fruit this year?

Mr. Finley: Yes, sir; I brought a sample of my plums down today, which I think are as fine as any in the State.

President Stevens: I wish to say that that last Legislature saw fit to increase our appropriation for this Society, not as much as we had hoped for, but enough to enable us to extend our work more than we have done in the past, and the Executive Committee, as I understand it, propose now to give this extension work more time, and I believe have decided to open an office in the city of Indianapolis and keep someone there at the office all the while and keep fruits from the different parts of the State there all the time on exhibit, so that the visitors at the State capital may see what Indiana is doing along the line of producing fine fruit. I know that every horticultural society in the State will take great pleasure in laying upon the tables samples of the best fruit they produce. We want to show the world what we are doing in the way of producing fine fruit. We should at least waken up to the fact that we should be able to produce all the fruit we could consume in Indiana instead of sending abroad for it.

Joe A. Burton: As agent for the Burton Fruit Company I selected and sent some of the fruit to Indianapolis to set before the Legislature, and also some of the cider; and I guess they got away with it. We wanted an appropriation. We told them what Mr. Keach had said about Indiana spending so much money annually abroad for fruit for Indiana, and that we did not think this should be. I wonder if I could say something to you that would make you mad and start you to thinking about these questions. We are not treating the State appropriation fair when we do it. We must show the people of the State how this is to be done, and we are trying to do this at the Burton Fruit Farm. We are trying to demonstrate that good fruits can be grown in Indiana and that they will sell pretty well right where they grow. Come down and see them. I think, Mr. President, that it might be money well spent for you to select some good persons whom the people have faith in to come down here and see the apples and make a report on them at the winter meeting of this society. They could report whether or not we were making apple-growing profitable.

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President Stevens: I will say in reply to Mr. Burton that we have a Fruit Committee, whose business it is to look after the experimental orchard, and I will increase their duties to this extent, and we would like to have a report from that committee at our winter meeting, in regard to the quality, quantity and variety of fruit grown at the Burton Apple Orchard. I believe this closes the program for this afternoon. It is to be regretted that the weather was so inclement today, as several of our speakers went home, thinking there would be no session this afternoon, but in the main I want to say that the State Horticultural Society has been pleased with their treatment here at Henryville, and we hope to see you again. All horticulturists should bear in mind that the Society has two meetings each year. The next meeting is the annual meeting, which meets at the State House in December of this year, when the officers are elected. We always have some of the best speakers we can get in the United States, and they speak on different topics, so that every person who is interested in the business will find it very profitable and entertaining to attend this winter meeting of the State Horticultural Society. We should like to hear from more of you, but on account of the lateness of the hour we will have to adjourn, but before we adjourn we should like to have a selection of music by the orchestra.

(Music by the orchestra.)

President Stevens: You may now consider yourselves adjourned. We will be glad to see as many of you as possible at the meeting at Indianapolis this winter.

(Mr. Ritterskamp could not be present, and as there was no opportunity offered, this paper was not read.—Secretary.)

BUSH FRUITS FOR SOUTHERN INDIANA.

BY W. J. RITTERSKAMP, PRINCETON.

While it would be interesting to hear something about the classification and subdivision of bush fruits into families and types, we will not dwell on this, but rather find if there be a profit in the raising of bush fruits throughout this section.

We have found it profitable at Princeton to grow black raspberries

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and blackberries; also gooseberries, while the red raspberries, and especially currants, were not so profitable.

For the past three years black raspberries have sold in our local market at 50 to 60 cents per gallon retail for the greater part of the season, and at 40 cents only for a few days during a temporary glut. I shall try to show that they can be grown profitably for 25 cents per gallon wholesale. St. Louis and Chicago markets have been quoting them at from $1.50 to $3 per crate of 24 quarts or 6 gallons, or 25 to 50 cents per gallon. Now I am sure that properly grown Cumberlands, if placed on market in fairly fresh condition, would find ready buyers at 50 cents per gallon, or $3 per crate, for all one wished to supply, especially after people once got a taste of them.

Those of you who have noticed black raspberries and blackberries on market in our large cities undoubtedly were disappointed at seeing the bulk of stock small, seedy and the blackberries ill colored. The sections where these are grown in commercial quantities—Southern Illinois (Egypt), Arkansas and Tennessee—are not equal in soil and climate to southern Indiana, the home of the blackberry and raspberry in their wild state. The soil of the sections named does not produce such healthy, vigorous cane as we see here. Those people are farther removed from market than we, and this extra haul of a day does show in appearance of the berries. They can not get enough intelligent white help at high prices; we have an abundance, and get it at fair prices. Markets such as Cincinnati, Louisville, Indianapolis, St. Louis and Chicago are at our very doors. Fruit packages are manufactured within a few miles of our berry patches—New Albany, Indianapolis, Evansville and Vincennes—each having extensive plants. Freight rates are reasonable, and, best of all, Indiana berries command a premium of from 25 to 50 cents per crate at least at St. Louis and Chicago. Then, why not grow them?

In selecting a location for blackberries or black raspberries, I should prefer a fairly level field and one that has not been cleared many years, although some of the finest berries I ever saw were grown on a rather steep hillside, on ground that had been growing ordinary farm crops for probably forty or fifty years. Our fields have been cleared and in farm crops for more than sixty-five years, and since quite a portion of southern Indiana fields are set on edge, so to speak, there is nothing that would better fit these than bush fruits. There need not be but one breaking of the soil in six or seven years. The soil, filled with roots and mulched, will not be subject to washing away nearly so much as when grain is grown, and in place of impoverishing the same, as with the latter, we make it richer and better every year we grow bush fruits.

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Prepare the plot well before setting. This is an old saw, and sounds out of place, yet it is the foundation of success and is often grievously neglected. Get a firm bed, do not plow under coarse manure or trash; both will be of great benefit as a mulch on top later on, but an injury plowed under. Give plenty of room between rows.

Most nurserymen recommend too close setting; they have plants to sell and the more you set to the acre the better for them. I would recommend not less than six feet between rows of black raspberries and eight for blackberries. Set plants three feet apart in the rows, the raspberry tips rather shallow, not more than two inches from top of crown to surface of soil.

Do this planting early in spring, about the time you plant early potatoes, early in April; then plants are almost dormant, the weather cool and soil moist, favoring a rapid start and sturdy growth. Cultivate often, at least enough to keep weeds down. A row of potatoes or of tomatoes or cabbages may be grown between rows the first season. In a very wet season this practice will cause trouble, as grass and weeds will often choke the berry plants after it is impossible to do more horse cultivating on account of the extra crop planted between. In this case use the hoe and butcher knife, for you must keep the young plants from growing tender and bleached.

Pinch out the tip of the young canes when eighteen inches high to cause lateral growth. These laterals of the black raspberry will take root on all sides, staying the cane during strong winds and furnishing an abundance of new plants for further setting or sale.

In February and March cut back these lateral branches, leaving about 12 to 14 inches for fruiting. In later years, when a number of canes spring from the crown, remove the weaker ones, leaving four to five of the strongest. Hoe out and destroy all young plants not needed for new settings or sale, for they are as bad or worse than weeds. After the bushes begin bearing there will be old dead wood to be removed in spring; this can be cut out at same time when laterals are being shortened and surplus canes cut away.

Remove these trimmings and burn them. Cultivate the bushes if the field is fairly level, otherwise mulch if straw can be gotten at reasonable rates. We use strawy manure the second and fourth year after setting, mulching the row about 18 inches on each side of plant and about four to six inches deep. If rows are very long it would be well to have a ten-foot middle about every tenth row to drive through when mulching. This mulch we apply after pruning early in the season.

Gooseberries should be set four feet apart in row, rows to be five feet apart; six would be better yet. After they begin bearing cut out

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about one-third of the old wood every year and head back the new straight shoots probably one-third, to cause branching and a heavier cane at base. Use powdered white hellebore dusted on foliage when dew is on to destroy the currant worm should they appear; do this in time, before foliage has been destroyed. If one can get a supply of wood ashes cheaply, say from some nearby sawmill, it will pay well to haul and apply them at the rate of three or four tons per acre; less would do, but one can hardly scatter it from a wagon evenly over the entire surface with a shovel and apply less. One application in four years is sufficient.

VARIETIES.

There are quite a number of blackcap raspberries listed. Our choice would be Cumberland, Plume, Farmer, Kansas and probably Gregg, although the latter has not given us the satisfaction that the others have. From among the red raspberries I would choose Early King and Cuthbert, for purple, Columbians and Cardinal.

The reds need only five feet between rows; they must not be pinched back, but a severe thinning and cutting back of the remainder to about four feet in spring will be in order.

Of blackberries our choice would be Early Harvest, Eldorado and Taylor. The most satisfactory of gooseberries are Downing and Houghton; of currants, Pomona.

You will probably want to know something about the probable returns from an acre set to bush fruit. I will give an estimate on black raspberries, and the returns from blackberries are about the same; also with gooseberries. We have never measured our plantings of raspberries, but we can come near giving a fair estimate.

It will require 2,500 plants set 3x6 feet to plant an acre. The third year, and for three years after, these bushes should bear one-half gallon each, at least; this would give us 1,250 gallons, or 208 crates of six gallons each. A fair average price per crate would be $2, or 33⅓ cents per gallon; 208 crates at $2 each would bring $416. Expense account about as follows:

Picking at 6c per gallon	$75 00
208 crates and quarts at 16c	32 28
Commission at 10 per cent	41 60
Expressage 50 cents per 100 pounds, or 17 cents per crate	35 36
Total	$184 24

Expense of $184.24 from $416 leaves a net gain of $231.76 per acre.

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Thirty-one dollars and seventy-six cents should be ample to pay for pruning and mulching and otherwise caring for the patch of one acre, leaving $200. A price of $1.50 per crate or 25 cents per gallon average through the season would still show a net balance of $138.16, or $100, after deducting for pruning and caring for the plat. This shows up as well as alfalfa, does it not? In eight years' experience in Gibson County we have not been troubled with anthracnose on the raspberry canes; whether this is due to the varieties or the soil I can not answer. We have grown a great many of the listed varieties and Gregg is very much subject to the disease. We have had some rust on our harvest blackberries; also on Britton, Erie and Early King, but by cutting and burning the affected canes we have kept rust in check so it has caused no damage thus far. In conclusion I would say, select strong, healthy plants, feed them well, keep free from weeds and you will find a handsome profit as well as pleasure in growing bush fruits in southern Indiana.

(Dr. Wolfe, having been called away, could not deliver his address on this subject, but furnished this brief for publication.—Secretary.)

THE BEST AND MOST ECONOMICAL WAY TO FERTILIZE SOUTHERN INDIANA SOILS FOR PROFITABLE FRUIT CULTURE.

BY DR. H. S. WOLFE, NEW ALBANY.

Mr. Chairman, Ladies and Gentlemen—I have but little to say to you other than what I have learned by experience. Theory or science will only be hinted at for the purpose alone of making clear what I have to say on the subject assigned me. Since 1879 I have owned four farms, more or less run down, comprising about 700 acres of land situated in the clay soils of Harrison and Floyd counties. I have made a fair profit on these investments by bringing up the fertility of these lands and then disposing of them at an advance, and I think I am therefore qualified by experience to speak on the subject.

Fertility for Fruit Growing.—I am expected to discuss the best and cheapest way to fertilize the soils of southern Indiana for profitable fruit growing. This may imply that the soils of southern Indiana are not now profitable for this purpose, and this implication is both true and false. Some of the soils are profitable and some are unprofitable, and it is probably true that all could be made more profitable by judicious management and cultivation. It becomes important, therefore,

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to inquire what may be the cause of the unproductiveness of some of these soils.

Diagnosis.—The diagnosis, as the doctors say, should be correctly made before a course of treatment is adopted for disease, and it is equally as important here in the treatment of unproductive land. We should first know what is wanting in order to apply the proper remedy.

The soils of southern Indiana are probably deficient in more than one particular, but I am satisfied if but one element of fertility be properly supplied all the rest will come if needed without effort. This one ingredient to be supplied in our clay soils is humus, or decaying vegetable and animal matter. Supply this in proper quantity and I believe the problem will be solved.

The Necessity for Humus.—The necessity for humus in the soil may be shown in many ways, and too much can hardly be said in this regard. The deficiency of humus is the one great and overshadowing defect in the greater part of the soils of southern Indiana. No attempt at the fertilization of these soils will be successful without a material increase of the humus content. Commercial fertilizers may be applied in any amount, but unless the soil contains a proper amount of humus it will profit little or nothing. On the other hand, if humus is present an immediate and profitable return will be made.

The Minnesota experiment station has shown that "oats, wheat and barley can be grown in prepared sand, when the only mineral food is that combined with the humus." So great is the power of humus that it alone will secure enough plant food from the soil to grow a profitable crop. All farmers know that it is useless to apply commercial fertilizers to the clay points in their fields where the vegetable matter has been greatly reduced, and just in proportion as this is the case in other fields it becomes unprofitable to use them. Let us note a few of the things humus will do for the soil, by which it will be made more productive.

One of the important offices of humus in the soil, and which has not been appreciated as it should be, is its power to render other elements of fertility already in the soil available for plant food. Much of these elements, though in abundance in the soil, are inert until brought into contact with humus and thus made available. The station above referred to asserts that "during the decay of animal and vegetable matters acid productions are formed, which unite with the mineral matters of the soil, particularly with the potash and phosphoric acid, forming compounds known as humatis, which are valuable forms of plant food." Rendering available the inert elements of fertility already in our soils is one of the best and cheapest ways to increase production, and the increase, or presence, of humus will surely do it.

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Another one of the important uses of humus is its power to retain moisture in the soil. Crops of all kinds are often rendered unprofitable for want of moisture, and therefore anything that will aid in retaining its water content is of first importance. It is well known that all fields in which the humus has been greatly exhausted become dry and hard long before those well supplied with vegetable matter. Increase the humus in these old fields, and profitable crops may be grown with a much lighter rainfall.

Still another one of the offices of humus is to render the soil more porous and friable, and through these qualities to let in the air and sunlight so essential to that chemical action which is fertility itself. A hard, compact clay excludes air and light, and will not retain moisture, and so but little chemical action can take place in these conditions. The microbes that produce fertility can not thrive in a soil of this kind. It is highly necessary, therefore, that the soil should be kept open and friable, and it is one of the offices of humus to do it.

There are other important offices of humus—the power it has to retain nitrogen, for example—but the limits of this paper forbid further consideration of them. Enough has been said to show the absolute necessity of humus in the soil in order to secure profitable returns. The presence of a proper amount of humus lies at the very base of all successful improvement of our soils. There is scarcely an acre of land in southern Indiana but what would be made better by an increase of its humus content, and very much of it is now wholly unprofitable because of the absence of it. The increase of humus, then, is the one thing needful, if real improvement of our clay soil is to be expected. Get humus and you will get fertility, is an axiom that will bear unreserved adoption. It must either be in the soil naturally or supplied to it artificially. The all-important question then is:

How Is the Best and Cheapest Way to Supply Humus?—There are many ways to secure this important element of fertility, but I am limited to what I deem the best and most economical way. I have experimented during the past twenty-five years with several methods, only to discard them one after another, and for one reason or another, until I finally hit upon a two-year rotation of certain crops in connection with a judicious use of commercial fertilizers.

Any rotation of crops that contains in the course a legume to secure nitrogen or a grass crop will increase the fertility of land more or less, but there is a wide difference in the value of the different systems practiced. One that will increase the humus most surely and most rapidly, and at the least cost, is obviously the one to be adopted.

A two-year rotation will certainly do this if the right crops be

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chosen and the right method be followed in their culture. The course I have lately pursued with satisfactory success is as follows: I divide my tilable land into two fields of nearly equal size, and every spring all of both are thoroughly plowed with a three-horse riding plow. One of these fields is then planted to corn and the other to cow-peas, and both are fertilized more or less liberally with a complete commercial fertilizer, and are thoroughly cultivated in the usual way. When mature, all of both crops is harvested and secured under shelter, and from there fed to stock upon the farm and all droppings from the animals carefully saved in a manure shed secure from bleaching rains, and at suitable times returned to the poorest part of the fields. As soon as these crops are removed from the land, all of both fields are disked and thickly sown to rye and this also fertilized with a complete fertilizer.

At the proper time this rye is pastured with light cattle, sheep and hogs, and this will be worth as much as it cost to seed the crop. In the spring following all of both fields are again thoroughly plowed, turning under the rye crop, which will furnish to the soil, in the roots and tops, a large amount of vegetable matter to be converted into humus, in addition to the large amount furnished by the roots and stubble of the cow peas and corn, and the stable manure above mentioned. The field that was in cow peas the year before is now planted to corn, and the one in corn the previous year is planted to cow peas. And this rotation should be continued from year to year until the land is as productive as desired. In from three to five years it will yield large crops of any kind, and will then be profitable for any kind of fruit culture. I am satisfied any of our clay lands that do not wash, and are not too wet, can be made to yield 100 bushels of corn per acre in five years by this process. Indeed, I have done nearly as well in much less time than five years.

If it is desired to renew an old orchard, or to fertilize a new one already planted, the above course should be varied considerably. Deep plowing should be avoided and the corn crop should be omitted. The yearly growth of cow peas and rye fertilized to be turned under will soon cause all the growth of the trees desired.

Why Corn, Cow Peas and Rye?—Why have I adopted the above crops for my rotation? Simply because they are more certain and more profitable than any other. Clover can not take the place of cow peas as a legume because it is both too uncertain and too slow. Even if secured it is not as valuable a crop either for feed or as a fertilizer as the cow pea. Crimson clover would be better than rye, because it is also legume, but as a winter cover crop it is entirely too uncertain to be depended on. The hairy vetch might displace the rye, as it is also a

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legume and a good winter grower, but the seed is too high-priced now to make it profitable. I have not tried it. Nothing can take the place of the corn crop, because it is the most profitable under ordinary conditions of any crop the farmer can raise.

Will It Pay?—Yes, surely. The small farmer who can live off of the farm and improve it at the same time is on the high road to prosperity. He may not see the dollars in gold and silver, nor will he hear them jingle in his pocket, but he will have them much more securely in his land than in coin—an investment that will pay.

The farmer who has his barn full of corn-stover and cow pea hay, and his crib bursting with big ears of corn and a silo full of silage, and a farm growing richer every year, is in no bad condition. Such crops fed to stock on the farm, for beef, milk and butter, and pork, will return more to the farmer than if sold and taken away from the farm, as it usually is.

The corn crop, if good, is always a money crop, no matter how used. The cow peas can be made to yield money directly better than wheat or oats by picking the peas and selling them for seed and leaving the vines on the ground for humus. The rye will more than pay for itself by the pasture it will afford, and the humus it will also supply. The grain and the hay and the silage, the pasture, the humus and the plant food, including nitrogen, gained by this rotation will be rapid and great. Will it pay? I know it will, because I have tried it.

STATE BOARD OF HORTICULTURE.

The State Board of Horticulture met in executive session at Henryville, Ind., August 10, 1905, and passed upon and allowed bills as follows:

To Joe A. Burton, Superintendent Experimental Orchard, salary...	$125 00
To W. B. Flick, Secretary, salary.....	150 00
To Sentinel Printing Company, printing, postage and stationery...	91 43
To W. B. Flick, postage, expressage and other office expenses..	70 20
To Ella Shera, stenographer, for services at Henryville.....	25 00
To W. W. Stevens, expenses as President.....	4 75
To Mrs. W. W. Stevens, expenses attending Henryville meeting..	4 75
To H. H. Swaim, expenses as Vice-President.....	16 55
To L. B. Custer, for premiums paid at Henryville.....	15 50
To L. B. Custer, expenses as Treasurer.....	11 75
To Joe A. Burton, expenses attending Henryville meeting.....	5 25
To W. A. Bell, expenses attending Henryville meeting.....	5 35

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To E. Y. Teas, expenses member Executive Committee.....	$19 40
To James Troop, expenses member Executive Committee.....	34 15
To Walter S. Ratliff, expenses member Executive Committee.....	18 45
To C. M. Hobbs, expenses as member Committee on Experimental Orchard	20 80
To W. C. Reed, expenses as member of Committee on Horticulture	10 00
To J. J. Millhous, expenses as member Committee on Horticulture	6 85
To John Tilson, expenses as member Committee on Horticulture.	6 15
To A. W. Shoemaker, expenses as member Committee on Horticulture	8 00
To C. N. Lindley, expenses as member Committee on Horticulture	4 45
To J. M. Snodgrass, expenses as member Committee on Horticulture	8 70
To H. W. Henry, expenses as member Committee on Horticulture.	16 25

W. B. FLICK. Secretary.

W. W. STEVENS, President.

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Report of the Forty-Fifth Annual Meeting

OF THE

INDIANA HORTICULTURAL SOCIETY,

Held in Rooms 11 and 12, State House, Indianapolis, Ind., December 6-7, 1905.

The forty-fifth annual meeting of the Indiana Horticultural Society was held in Rooms 11 and 12, State House, Indianapolis, Indiana, on December 6th and 7th. The meeting was called to order at 10:30 on the morning of the 6th, with President Warder W. Stevens in the chair, who said:

President Stevens: The society will now please come to order and we will proceed with the program that is laid down for us today. The first will be an invocation by Reverend Walter B. Smith, of Arlington, Indiana.

Rev. Smith: (Let us all stand.) Our Father who art in heaven, we come into Thy solemn presence this morning grateful for the privilege of this day, thankful that we may lay before Thee our plans and that we may enter upon this work with Thy approval. Help us to study all the time to show ourselves approved of God, doing nothing whatever of which we would be ashamed. There are great themes before us today; grant that we may enter into them with thought, and with skill, so that we may make our calling successful. Bless the deliberations of this day, and help us that in our research we may seek for Thy approval, doing nothing but upon which we may call Thy blessing. Bless us and help us in the duties of this hour. Help the officers who have this in charge, that the deliberations may be decent and orderly, and that Thy name may be glorified. Show us what we may have to do, and show us that which is wrong, and help us that we may forgive those who have wronged. We pray this for Jesus' sake. Amen.

President Stevens: It has been suggested to me that we have a committee of solicitors to solicit members for the society, whose duty it is to assist the Secretary, and I am going to name on that committee the following persons:

Mr. J. C. Grossman, Mr. E. Y. Teas and Mrs. W. B. Flick.

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The judges on fruits and flowers will consist of the following named persons:

H. M. Stout, W. C. Reed and James Troop.

The first thing in order is the report of the officers, the Secretary and Treasurer. The Secretary will come first.

Secretary Flick: Mr. President, Ladies and Gentlemen—

SECRETARY'S FINANCIAL REPORT FOR 1905.

To the Members of the Indiana Horticultural Society:

I have the honor of making the following report for the fiscal year ending October 31, 1905.

Account of Membership Fees—	
Amount received from members August, 1904, to October 31, 1904	$64 50
Amount received from members October 31, 1904, to October 31, 1905	84 50
Total receipts from membership fees	$149 00
Paid to Treasurer February 14, 1905, and October 30, 1905	149 00
Account with State Fund—	
Balance on hand October 31, 1904	$30 14
Received from Auditor of State November 1, 1904	1,500 00
Total receipts from State	$1,530 14

EXPENDITURES.

1904.			
Dec.	8.	To W. W. Stevens, expenses attending board	$12 00
"	8.	To H. H. Swaim, expenses attending board	12 00
"	8.	To S. Johnson, premiums paid out	72 85
"	8.	To W. C. Reed, expenses member Horticultural Committee	9 00
"	8.	To C. N. Lindley, expenses member Horticultural Committee	9 85
"	8.	To A. W. Shoemaker, expenses member Horticultural Committee	1 40
"	8.	To H. W. Henry, expenses member Horticultural Committee	10 60
"	8.	To Snead Thomas, expenses member Horticultural Committee	3 30
"	8.	To C. W. Foote, expenses member Horticultural Committee	10 50
"	8.	To J. C. Grossman, expenses member Horticultural Committee	12 55

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Dec.	8.	To E. Y. Teas, expenses as member Executive Committee	$4 75
"	8.	To Walter S. Ratliff, expenses as member of Executive Committee	5 00
"	8.	James Troop, expenses as member Executive Committee and Experiment Orchard	13 85
"	8.	To H. H. Swaim, as entry clerk	5 00
"	8.	To Mrs. W. W. Stevens, Committee on Experiment Orchard	1 60
"	8.	To J. M. Zion, premiums on apples	4 00
"	8.	To C. M. Hobbs, expenses as Committee on Experimental Orchard	7 05
"	8.	To Ella Shera, stenographer	46 00
1905.			
Jan.	25.	S. Johnson, expenses transferring treasury	4 00
Aug.	10.	To Joe A. Burton, salary, first and second quarter 1905	125 00
"	10.	To W. B. Flick, salary, first and second quarter 1905	150 00
"	10.	Sentinel Printing Company, printing, stationery, etc.	91 43
"	10.	To W. B. Flick, office expenses as per bill No. 2	70 20
"	10.	To Ella Shera, stenographer (H)	25 00
"	10.	To W. W. Stevens, expenses attending board meeting	4 75
"	10.	To Mrs. W. W. Stevens, expenses attending board meeting and Experiment Orchard	4 75
"	10.	To H. H. Swaim, expenses attending board meeting.	16 55
"	10.	To W. C. Reed, expenses as member Horticultural Committee	10 00
"	10.	To J. J. Millhous, expenses as member Horticultural Committee	6 85
"	10.	To A. W. Shoemaker, expenses as member Horticultural Committee	8 00
"	10.	To John Tilson, expenses as member Horticultural Committee	6 15
"	10.	To C. N. Lindley, expenses as member Horticultural Committee	4 45
"	10.	To J. M. Snodgrass, expenses as member Horticultural Committee	8 70
"	10.	To H. W. Henry, expenses as member Horticultural Committee	16 25
"	10.	To E. Y. Teas, expenses as member Executive Committee	19 40
"	10.	To Walter S. Ratliff, expenses as member Executive Committee	18 45

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Aug. 10.	To Joe A. Burton, expenses attending horticultural meeting	$5 25
" 10.	To W. A. Bell, expenses attending horticultural meeting	5 35
" 10.	To C. M. Hobbs, expenses as member committee Experiment Orchard	20 80
" 10.	To James Troop, expenses Executive Committee and committee Experiment Orchard	34 15
" 10.	To L. B. Custer, premiums paid at Henryville	15 50
" 10.	To L. B. Custer, expenses as Treasurer	11 75
Oct. 22.	To W. B. Flick, salary second and third quarter 1905.	150 00
" 22.	To Joe A. Burton, salary second and third quarter 1905	125 000
" 22.	To L. B. Custer, cost of surety bond	9 00
" 30.	To W. B. Flick, office expenses	67 14
	Total expenditures	$1,275 17
Balance on hand October 31, 1905		254 97
		$1,530 14

The appropriations for 1906 and 1907 will be $2,600 each year.

Respectfully submitted,

W. B. FLICK, Secretary.

President Stevens: I should like to ask for the information of the society whether we have drawn anything from the last appropriation.

Secretary Flick: Yes; the first day of November.

Mr. Zion: I do not remember of the Secretary's report telling how much we got from the Legislature. I have been asked this question several times, but I have never heard anything about it in the report.

Secretary Flick: On the first day of last November I received and handed over to the Treasurer twenty-six hundred ($2,600) dollars. This was the increased appropriation.

Mr. Zion: What was the amount appropriated by the preceding Legislature?

Secretary Flick: Fifteen hundred ($1,500) dollars.

Mr. Zion: And the one before that?

Secretary Flick: One thousand ($1,000) dollars. This twenty-six hundred dollars will be shown in our report next year.

Mr. Zion: I think the members of this Association lose interest in these subjects that are deferred for a year. I think it would be

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more satisfactory if we could find out about these things as we go along. There are many that will not express themselves.

Secretary Flick: We will have an item in future reports saying that the appropriation for the next two years will be so much.

President Stevens: We will now have the report of the Treasurer.

Treasurer Custer: Mr. President, Ladies and Gentlemen—

TREASURER'S ANNUAL REPORT.

December 6, 1905.

To the President and Members of the State Horticultural Society:

Gentlemen—I herewith submit my report for the year ending October 31, 1905.

RECEIPTS.

1904.			
Nov. 1.	Balance in Treasury	$30 14	
" 1.	Received from State	1,500 00	
1905.			
Feb. 17.	Received from Secretary, membership fees	64 50	
Oct. 31.	Received from Secretary, membership fees	84 50	
	Total receipts		$1,679 14

DISBURSEMENTS.

1904.			
Dec. 8.	Paid warrants Nos. 99, 101, 102, 103, 104, 105, 106, 107, 109, 110, 113, 114, 115—		
" 26.	100, 108, 111, 112—		
" 31.	116—		
1905.			
Jan. 10.	No. 117—		
Aug. 10.	Nos. 118, 123, 124, 125, 126, 127, 128, 129, 132, 133, 137, 138, 139, 140, 141, 142, 144, 145 and 146—		
" 15.	119, and 121—		
" 16.	120—		
Oct. 28.	147, 149—		
" 31.	122, 148 and 150	$1,275 17	
	Balance in Treasury	*403 97	
	Total		$1,679 14

Respectfully submitted,

L. B. CUSTER. Treasurer.

*This includes $149 membership fees.

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President Stevens: As I understand it, heretofore the year has run from the first of November of one year to the next. Is that right?

Secretary Flick: That is right. I understand that all State affairs run in that way. The year begins with the 1st of November.

President Stevens: These reports will take the usual course. I am going to appoint as the Auditing Committee—

R. A. Troth, C. N. Lindley and H. H. Swaim.

Professor Troop: I should like to ask a question concerning the present appropriation. I understand that we have it now and that it is in the treasury.

Secretary Flick: For the current fiscal year 1906.

President Stevens: These committees may report tomorrow morning. We are now ready for the report of the State Entomologist.

Professor Troop: Mr. President, Ladies and Gentlemen—

REPORT OF THE STATE ENTOMOLOGIST.

To the Indiana Horticultural Society:

The first and most important work of this office, as matters now stand, is the nursery inspection. In fact, that was primarily what the office was created for. And, according to law, this work must be done at least once each year in order to enable the nurserymen to do business. These nurseries are located in sixty-six counties, which makes it necessary to cover practically the whole State every year. The expense involved in this work makes it practically impossible to do much along the line of orchard inspection except what can be done by correspondence, which in most cases proves to be very unsatisfactory, because the average man is very slow to undertake the application of remedies that he is not perfectly familiar with, for fear the work will not be done in a proper manner. Hence, in order to do satisfactory work along this line it becomes necessary to employ experienced men, whose business it shall be to teach the people how to prepare and apply the various mixtures by going into the infested localities and giving practical demonstrations in both lines. It is my opinion, after six years' experience in this work, that this branch of the work is more important than the nursery inspection, because it affects more people, and also because if we could succeed in ridding the orchards of the State of the San Jose scale, there would be small need for nursery inspection at all. But this takes money, and as has been repeated several

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times in former reports, it can not be done with the present appropriation of $1,000. As may be seen by referring to the financial statement farther on, the present appropriation is barely sufficient to complete the nursery inspection, and to take care of the large and increasing correspondence which naturally belongs to this office.

The Ways and Means Committee of the last Legislature was asked to recommend an additional appropriation for the orchard inspection work, but the committee could not see any immediate necessity for such an expenditure and so the matter rests. In the meantime the San Jose scale is spreading in certain localities, and will continue to spread until vigorous measures are employed for its eradication.

In order to show that I am not over-estimating the importance of this phase of the subject, let me repeat again that Illinois appropriates $6,000 and Ohio $10,000 a year for the work that we are expected to do for $1,000. Said one of the official inspectors in another State recently: "Your appropriation of $1,000 is insignificant and I do not see how it can possibly afford very much protection to the great horticultural interests of your State."

I sincerely hope that the next Legislature can be made to see the importance of this work and that an appropriation will be made that will be sufficient to enable us to clean up these scale-infested districts.

KINDS OF MATERIALS USED AGAINST THE SAN JOSE SCALE.

Up to the present time the lime, salt and sulphur remedy seems to have given the best satisfaction. The California formula, viz., 50 pounds of stone lime, 50 pounds of ground sulphur and 50 pounds of salt, is easy to remember and is as reliable as any. It is prepared in the following manner: Slack the lime in a little hot water, gradually adding the sulphur and stir vigorously; boil one hour. Add the salt; boil fifteen minutes, strain, dilute with hot water to make fifty gallons of wash and apply while yet hot. This should not be applied while the trees are in foliage, but only while they are dormant. The first application may be made at any time after the leaves have fallen, and a second application should be given in early spring before growth commences. An iron kettle should be used for boiling the mixture, and an iron pump for making the application. Run clear water through the pump after the day's work is done in order to prevent clogging.

While this mixture is very effective, yet it is somewhat disagreeable to make, and so we are always glad to welcome any new remedy that promises success without the labor of mixing. We are now testing the efficiency of two materials which have been put upon the market, viz., "Kill-o-Scale" and "Scalecide." These are both being tested

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by Mr. W. J. Ritterskamp in his orchard, and that of Judge Welborne at Princeton, and the "Scalecide" by Mr. W. W. Clark of Elizabeth, Harrison County. Both mixtures are said to do the work perfectly, and if they do it will simplify matters a great deal, because no boiling is necessary in either case, and the expense is not great. In case of the "Scalecide" one gallon will make from twenty to twenty-five gallons of wash, and the cost, in 50-gallon lots, is fifty cents per gallon, plus the freight, or about two and a half cents per gallon of spray.

NEW SCALE-INFESTED DISTRICTS.

During the year the San Jose scale has been found in nine counties where it had not been found before, and in ten other new localities. This makes forty-eight counties in the State which either have it, or have had it, since the inspection law was passed in 1899.

In Jasper, Vigo, Clay and Johnson counties I am almost ready to say that the pest has been conquered, although we may find later that such is not the case. In fact, it would not be strange if other new infested localities were found in these same counties.

The new counties are Harrison, Spencer, Posey, Jackson, Delaware, Scott, Cass, Pulaski and Lake.

The new localities mentioned above are: Newburg and Boonville, Warrick County; Harrell, Jefferson County; Columbus, Bartholomew County; Ingleside, Vanderburgh County; Converse and Peru, Miami County; Bristol, Elkhart County; Vincennes, Knox County; Fort Branch, Gibson County, and one each in Indianapolis proper and Irvington.

In some of these localities the people are taking hold of the matter with a determination to stamp it out, asking nothing but advice as to the proper method to pursue. In others they are doing very little or nothing, failing utterly to grasp the magnitude of the situation. For example, in the city of Columbus the scale had become well established in many of the yards before it was discovered. Last August I received a letter from one of the prominent attorneys of that place, asking me to visit them and see what could be done. I found the situation fully as bad as had been represented, and as a result of the visit I agreed to appoint any citizen of their town that they might name, as my deputy with full authority to enforce the law, providing the city council would compensate him for his services. I quote below from a letter received some days ago from this same attorney, in reply to my inquiry after the condition of affairs:

"The city council here did nothing whatever towards supporting the man you appointed, and the situation is much more serious than when you visited us. Many people in our part of the city have cut

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and burned trees, and have done some spraying. A careful examination of my own premises disclosed the presence of the scale on trees and shrubs upon which we found none when you were here, although I cut and burned all peach and some plum trees we found to be infested immediately after you were here. The situation is really one of gravity and really needs heroic measures."

Last summer I was asked to meet with the county authorities of Grant County for the purpose of consultation regarding the probable cost of combating the scale in the city of Marion and adjoining country. I did so, and was later informed that the county council had come to the conclusion that the state of their finances would not justify an appropriation for that purpose, and so nothing was done. In the meantime the scale is spreading with alarming rapidity, so that it is only a question of a comparatively short time when that will be one of the worst scale-infested communities in the State.

As an illustration of the utter folly of cities, and counties too, for that matter, allowing these pests to spread at will, the case of the Gypsy moth in Massachusetts may be cited. This insect was introduced into Massachusetts from Europe some years ago, and was accidentally allowed to escape from captivity. It soon began spreading with alarming rapidity until the State finally appointed a commission and appropriated money to be used in exterminating the pest. After the commission had spent something like a million and a half dollars in the fight and had gotten it well under control, the State authorities decided that they would go no further, and refused to appropriate any more money. This allowed the moth free range again, and now the State has again taken up the fight as a matter of self-preservation, but it is estimated by expert entomologists that it will take at least five years for the commission to get it under as good control as they had it when the State decided to drop it. In the meantime it has spread to neighboring States and it is my opinion that before this pest is conquered, the United States Government will be obliged to take a hand in the fight, as it did recently in the case of the yellow fever in New Orleans: and it is to be hoped with as good results.

Another year at least must pass by before our Legislature can take any action in regard to the matter; if, in the meantime, the county and city authorities where the scale exists could be made to realize the importance of the situation, and appoint a competent man in each county to look after the work and provide for his compensation, a decided improvement would be observed in a short time and at slight cost.

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OTHER SPECIES OF INSECTS.

No serious outbreaks, except of a local nature, of other species of insects have been reported.

The woolly aphis (Schizoneura lanigera) is always more or less troublesome on nursery stock, especially in the southern part of the State, but where tobacco dust is used freely around the plants the insects seldom do permanent injury to the trees. However, we always advise throwing out trees whose roots show many of the characteristics—swellings—especially if the trees are going to a warmer climate. If the Stringfellow method were practiced in pruning the roots this would not be necessary.

The army worm (Lucania Unipuncta) made its appearance during the summer in Starke, Tippecanoe and Fountain counties, and perhaps others that were not reported. It did considerable damage to meadows and grain crops before it could be checked. A letter received from Starke County states that:

"The army worm made its appearance here in countless numbers, coming about July 1st. They seem to start in timothy meadows, and have already ruined hundreds of acres of timothy, besides many acres of oats and corn."

This is one of the species that usually breaks out in spots, and is liable to appear almost anywhere and at almost any time. The fencing-out method is the most satisfactory method known, as the insects cover such a wide range of territory. Plowing a furrow around the fields to be protected, leaving the perpendicular side of the furrow next to the field, will stop their progress in that direction, as they are unable to climb the steep, smooth surface.

The canker worm (Anisoptery poinstaria) has been reported from a few localities, but where the spray pump is used for the codling moth and other species of fruit or leaf-eating insects, the canker worm becomes of very little importance.

In Allen County and vicinity the old wheat stem worm (Isosoma tritisi) has played havoc among the wheat fields, but, while I have answered the many questions concerning it, I have not given it much attention, as the United States Bureau of Entomology has a special agent who is giving this and other small grain insects his special attention, not only in this State, but all over the United States, and who will give us the results of his investigations in due time.

The 17-year locust (Cicada Septendecim) made its appearance according to schedule, in the northwest counties of the State. The only counties reporting its presence are Lake, Porter, Laporte and Starke. So far as learned, no special damage was done to fruit trees. This

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brood is known to entomologists as Brood No. 5, which covers parts of southern Wisconsin, northern Illinois, the northwest corner of Indiana, the extreme south part of Michigan and the east part of Iowa. This brood is entirely distinct from the one which made its appearance nearly all over the State in 1902, which is known as Brood No. 22.

In addition to those already mentioned, the cottony maple scale (Pulvinaria Enumerabilis) and a number of other species of minor importance have been given due consideration as inquiries have been sent in concerning them.

With the exception of the San Jose scale, the insect problem during the year, taking the State as a whole, has not been a difficult one. Our old friends, the Hessian fly and chinch bug, have kept themselves pretty well in the background. But it will not do to presume too much upon this fact, because if we do we are liable to be caught napping.

A NEW SPECIES.

One year ago I reported the discovery of a new species of aphis, or plant louse, upon some Houghton gooseberries on the grounds of Mr. George Blue, of Indianapolis. At that time I had been unable to find any of the winged forms, hence could not give a complete description of the species. Last spring, however, a number of the winged specimens were found, so that now I am able to give a complete description of the species, which I have designated as Aphis Houghtonensis, because, so far as I have been able to discover, it will not work upon any other variety. Mr. Blue planted five acres of the Houghtons, but in the lot of plants set out there were a number of plants of another variety. These were scattered about the field, but in no case did the aphis touch them. I brought some of them home and endeavored to colonize them on the Pearl, Downing and other varieties, but in no case did I succeed in inducing them to feed; but the Houghton in Mr. Blue's field was so completely destroyed that the plants were dug up and another variety substituted. Under date of June 16, 1905, Mr. Blue writes thus:

"I think that if you could see our field now you would conclude that if we are to continue in the gooseberry business we will have to look for another variety. All of our work last fall in treating them was of no avail. It seems to be impossible to overcome them. Our field is a complete wreck and their season is only begun."

This fact makes it a species of considerable importance to the gooseberry grower, especially as no manner of treatment which was applied was of any effect in stopping its ravages.

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DESCRIPTION OF APHIS HOUGHTONENSIS.

The wingless females of the summer broods are about one-sixteenth of an inch in length, of a pale green color throughout; eyes prominent, antennae and legs of a yellowish tint and covered with scattering short spines, except the terminal joint of the antennae. Antennae rather more than half the length of the body. Honey tubes prominent, nearly as long as from their base to the tip of the abdomen. The winged forms measure nearly three-sixteenths of an inch to the tips of the wings when folded. The color of the wings and body a shade darker than the wingless forms. Antennae nearly one-half longer than the body; spread of wings three times the length of the body. Eyes somewhat darker than the wingless individuals, while the legs are not so spiney. Honey tubes about the same length in both forms.

NURSERY INSPECTION.

The inspection period extends from June 1st to October 1st and during that time we have inspected 163 nurseries, covering all the way from a few square rods to over three hundred acres of land. Two are under quarantine because of too close connection with the San Jose scale, and, of course, have been refused certificates. With this exception, I believe the nurseries of Indiana are in good condition.

FINANCIAL STATEMENT FOR THE YEAR ENDING OCTOBER 31, 1905.

RECEIPTS.

Amount received from the State Treasurer on vouchers submitted to the Auditor of State	$999 90

EXPENDITURES.

Traveling expenses, including hotel bills and livery hire	$260 19	
Postage, express and telegrams	26 02	
Stationery and printing	70 14	
Per diem of self and three associates	643 55	
Total		$999 90

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LIST OF INDIANA NURSERIES INSPECTED IN 1905.

Albertson & Hobbs, Bridgeport, Marion County. Location, one-half mile west of Bridgeport.

Alexander, J. B., Hartford City. Location, southwest part of the city.

Alstott & Son, J. M., Sunshine, Harrison County. Location, one and one-half miles southeast.

Bell, E. H., Richmond, Wayne County. Location, one mile east.

Baldwin, T. A., Oxford, Benton County.

Baldwin, William, Marion, Grant County.

Bennett, W. C., Scotland, Greene County. Location, four miles south of Koleen.

Bennett, A. S., Lafayette, Tippecanoe County. Location, near city limits, southeast.

Bennett, W. S., Carlisle, Sullivan County. Five miles northeast.

Bird & Son, John, Raysville, Henry County. Location, north side of town. Railroad station Knightstown.

Blue, George W., Indianapolis.

Bradley, C. P., South Bend, St. Joseph County. Location, three and one-half miles southeast.

Bremen Nursery Company, Bremen, Marshall County. Location, just outside of town.

Bridges, John M., Dugger, Sullivan County. Location, one mile east.

Broshears, Porter, Boonville, Warrick County. Location, one mile northeast.

Brown, Walter P., Connersville, Fayette County.

Brown, Mercer, Spiceland, Henry County. Location, one mile south of Spiceland, and one mile north of Dunreith.

Brownstown Nursery Company, Brownstown, Jackson County.

Buck, H. F., Elberfeld, Warrick County. Location, one mile south of Buckskin.

Bundy, W. P., Dunreith, Henry county. Location, one-fourth mile north of town.

Burch & McFarland, Stanford, Monroe County.

Burgo, Warren, Retreat, Jackson County. Location, two miles north of Crothersville.

Burgess, J. S., Moberly.

Burkhart & Son, Southport, Marion County. Location, three miles south of Indianapolis.

Capital City Nursery and Orchard Company, Indianapolis.

Card, P. A., Greenfield, Hancock County.

Cathcart, Alva Y., Bristol, Elkhart County. Location, near town.

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Cochran, L. B., Greensburg, Decatur County. Location, north side of town.

Cockrum & Son, W. M., Oakland City, Gibson County. Location, near city.

Conway, Peter, Galena, Harrison County.

Cook, J. L., Warsaw, Kosciusko County.

Cosby, L. C., Washington, Daviess County. Location, two miles southeast.

Cunningham & Son, J. H., Rising Sun, Ohio.

Cushman, E. J., Jasonville, Clay County.

Dean & Billingsley, Greenwood, Johnson County. Location, adjoining town.

Dickey, J. W., & Co., Doans, Greene County. Location, near town.

Dixon, C. S., Bloomfield, Greene County. Location, one mile north of town.

Dreyer, J. F., Frankfort, Clinton County. Location, in suburbs.

Eickhoff, Ed. A., Gallaudet, Marion County. Location, six miles southeast of Indianapolis.

Eickhoff, H. C., Julietta, Marion County. Location, four miles southeast of Indianapolis.

Engler, C., Walton, Cass County. Location, near town.

Everett, J. W., Butler, Dekalb County.

Forbes, J. W., Plymouth, Marshall County.

Fellows, A. T., Amboy, Miami County.

Fullhart & Co., Willard, R. F. D. 3, Muncie, Delaware County. Location, four and one-half miles southeast.

Gaar, W. H., Germantown, Wayne County. Location, residence in town. Nursery one and one-half miles southeast.

Gainey & Hostetter, Doans, Greene County.

Garber, D. M., Pierceton, R. R. 1, Kosciusko County.

Garretson, Amos, Pendleton, Madison County.

Goehler, Albert, Urbana, Wabash County. Location, three miles north.

Garrett, F. B., Burns City, Martin County. On S. I. R. R. Location one-half mile south.

Goble, Mrs. D. H., Greenfield, Hancock County.

Graham, Charles F., New Albany, Floyd County. Location, two and one-half miles northeast of city.

Graham, J. K., New Albany, Floyd County. Location, resides in the city. Nursery, two and one-half miles north.

Gregg, Warren C., Pennville, Jay County. Location, one-half mile northeast.

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Grossman, J. C., Wolcottville, Lagrange County. Location, two miles north.

Gustin, E. R., Peru, Miami County.

Haines, Joseph, Lake, Spencer County. Location, in town.

Haines, Thomas, Lake, Spencer County. Location, one and one-fourth miles south.

Hancock County Nurseries, Greenfield, Hancock County.

Harnish, George, Bluffton, Wells County. Location of nursery, five miles northwest. Resides in town.

Havelin, Alva, Attica, Fountain County.

Hazen, Smith, Hatfield, Spencer County. Location, one and one-half miles northeast.

Heacock, E. E., Salem, Washington County. Location, four miles northwest of town.

Heacock, J. W., Canton, Washington County. Location, one-fourth mile north of Canton.

Henby & Son, J. K., Greenfield, Hancock County. Location, one mile west.

Henry, H. W., Laporte, Laporte County. Location, one mile northwest of Laporte.

Hill & Co., E. G., Richmond, Wayne County. Location, one-half mile east. Florists.

Hiney, J. C., Noblesville, Hamilton County.

Hoagland, George T., Portland, Jay County. Location, five miles north of Red Key.

Home Nursery Company, Union City, Randolph County.

Hook, L. C., Albany, Delaware County.

Hoppes, John H., Redkey, Jay County.

Hostetter, Clarence, Scotland, Greene County.

Hughel, A., & Co., Anderson, Madison County.

Irvin, William A., Vincennes, Knox County.

Jarrett, J. A., & Son, Montpelier, Blackford County. Location, three miles northwest.

Jeffries, E. T., Chandler, Warrick County. Location, one-half mile south.

Jessup, Fred, Westfield, Hamilton County. Location, five miles northeast.

Kelly & McFerran, Columbus, Bartholomew County.

Kepler, S. W., Winamac, Pulaski County. Location, five miles southwest of Pulaski.

Killinger, Wes., Bloomfield, R. R. 1, Greene County.

King, W. D., Scotland, Greene County. Location, five miles south of Koleen.

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Knaub, Ben, North Vernon, Jennings County. Location, five and one-half miles northeast.

Korner, Joseph, Star City, Pulaski County. Location, two and one-half miles west of town.

Kuebler, Theodore D., Armstrong, Vanderburgh County. Location, two miles south.

LaHane, William, Chesterton, Porter County. Location, suburbs of the town.

Lapel Nursery Company, Lapel, Madison County.

Lucas & Lester, Bloomfield, Greene County. Location, four miles east of town.

Lutes, O., Portland, Jay County.

McClaren & Son, Sunshine, Harrison County. Location, one-fourth mile southwest.

McCoy, J. E., Bourbon, Marshall County. Location, one-half mile south.

McElldery, W. E., Boonville, Warrick County. Location, in town and one-half mile south.

McFarland, John, Ridgeville, Randolph County.

McGinnis, D. A., R. F. D. 1, Andrews, Huntington County. Location, ten miles south and two miles west of Andrews.

Murray, A. M., Goshen, Elkhart County.

Mason, B. F., Martinsville, Morgan County. Location, seven miles south.

Meeker, H. H., Crown Point, Lake County.

Meredith & Son, Koleen, Greene County. Location, two and one-half miles southeast.

Metz, J. B., Huntington, Huntington County.

Milhouse, George Bristol, Elkhart County.

Millhouse, Jesse G., Ezra, Jennings County. Location, four and one-half miles southeast of Butlerville.

Mills, Grant, Portland.

Minnick, Henry, Converse, Miami County. Location, three and one-half miles northeast.

Moffett, Frank, Carmel, Hamilton County. Location, two and one-half miles southeast.

Moon, H. E., Portland, Jay County.

Moore, C. B., Monticello, White County. Location, two miles west of Monticello.

Moriarity, Pat, Hyde, Jennings County. Location, one and one-half miles east.

Morris, Thomas M., Clinton, Vermillion County.

Moyer, G. N., Laketon, Wabash County. Location, one and one-half miles south.

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Morrison, O. A. J., Middlefork, Clinton County. Location, six miles south of Michigantown.

Nation, Charles, Gilead, Miami County.

Osborne, A. C., Bloomfield, Greene County.

Overman, J. C., & Son, Raysville, Henry County. Location, one-half mile east.

Patterson, R. T., Bloomfield, Greene County. Location, one mile south of town.

Paxson & Son, George, Pennville, Jay County. Location, three miles northwest.

Peffley, T. J., Dora, Wabash County.

Pennington, C. C., North Vernon, Jennings County.

Perry, Alexander, McCutcheonville, Vanderburgh County.

Phillips Bros., Hobbieville, Greene County. Location, one-half mile north.

Potter, E., Redkey, Jay County. Location five and one-half miles north.

Preble, A. C., Marion, Grant County. Location, 303 North Boots Street.

Ragle, Amos, & Son, Elnora, Daviess County. Location, one mile south of Elnora.

Randolph Bros., Lafayette, Tippecanoe County. Location, three miles southeast.

Reed, U. H., Jr., Harrell, Jefferson County. Location, two and one-half miles southeast of Harrell.

Reed, W. C., Vincennes, Knox County. Location, two miles southeast.

Rogers, Hugh, Knox, Starke County. Location, one mile south.

Rogers, R. S., Bloomfield, Greene County. Location, two miles northwest of town.

Scott, Charles H., Winamac, Pulaski County. Location, one and one-half half miles southeast of town.

Semon, H. C., Bennville, Jennings County. Location, one and one-half miles east in Ripley County.

Shields Bros., Charlottsville, Hancock County.

Sibert, A. B., Rochester, Fulton County.

Simpson & Sons, H. M., Vincennes, Knox County. Location, two miles east.

Sleeper Bros., Fowler, Benton County.

Small, William H., Attica, Fountain County. Location, near town.

Smith, W. F., Battle Ground, Tippecanoe County.

Smith, Al B., Garfield, Montgomery County. Location, five miles northeast of Crawfordsville.

Smith, W. H. H., Medaryville, Pulaski County.

Snodgrass, J. M., Kirkland, Clinton County. Location, two and one-half miles southwest of Circleville.

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Snoddy Nursery Company, Lafayette, Tippecanoe County.

Stacey, W. E., Lyons, Greene County. Location of nursery, two miles north.

Stineman, Jonas, Wawpecong, Miami County. Location, six miles east of Bennets.

Stout, W. C., Monrovia, Morgan County. Location, two and one-half miles southwest.

Swift, H. B., Hartford City, Blackford County.

Swaim, H. H., South Bend, St. Joseph County. Location, three miles southwest.

Teas, E. Y., Centerville, Wayne County. Location, one square from the interurban line.

Terrell, O. E., Bloomfield, Greene County. Location, one-half mile north of town.

Truex, G. W., Lockman, Brown County. Location, seven miles north of Freetown.

Vernia, Mrs. Elizabeth, New Albany, Floyd County. Location, three miles southwest of city.

Wabash Valley Nursery Company, Bluffton, Wells County. Location, adjoining the town on west.

Walker, F., & Co., New Albany, Floyd County. Location, two miles northeast.

Ward, T. J., St. Mary's, Vigo County. Location, two and one-half miles northeast of St. Mary's and six miles northwest of Terre Haute.

Warren, D., Carmel, Hamilton County.

Webb, T. J., Attica, Fountain County. Location, northwest of town.

White, Harry, North Manchester, Wabash County.

Wickizer, James M., Plymouth, Marshall County. Location, two miles south.

Williams, George R., Knox, Starke County.

Wilson, J. W., North Judson, Starke County. Location, near town.

Winchell, G. W., Tobinsport, Perry County. Location, northeast of W. R. Polk.

Wright Nursery Company, J. M. T., Portland, Jay County. Resides one mile west.

Young, George C., Greensburg, Decatur County. Location, one mile southeast.

Respectfully submitted,

JAMES TROOP,
State Entomologist.

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President Stevens: You state that the Hessian fly has been in the background for the past year. Can you tell one year what the next year will be in regard to that?

Professor Troop: These flies usually make their appearance about every two or three years, and then disappear. It is now on the decline.

President Stevens: How long will it be gone?

Professor Troop: Two or three years, and then will come up again. It was in the southern part of the State for two years, and they may have it next year, and may not. It is controlled by a parasite. As the flies increase in numbers of course the parasite increases, until they have increased sufficiently to kill it, or practically or nearly kill it, for they never kill them all, and of course the next year we will not have them, and perhaps not for two years. When the fly dies off there is not much for the parasite to live on and he dies off and that gives what few flies there are remaining a chance to increase again, and so in two or three years you have them again. That is the way most of our native insects work. All of them, I guess, have their parasite enemies, and they work in that way. For two or three years they will be very abundant, and then for two or three years they will be very scarce; that is the way they work. With the San Jose scale it is different, simply because it has nothing to hold it in check.

Rev. Smith: I should like to ask why you did not speak of mildew in regard to the gooseberry.

Professor Troop: That does not belong to my field.

Rev. Smith: It does as much as the San Jose scale.

Professor Troop: It is not a very common disease on native gooseberries. European gooseberries are very often attacked and some die, but our native ones are not.

Mr. Kingsbury: Please tell us how long it takes a scale to kill a pear or plum tree, for instance.

Professor Troop: That depends on how many there are there, and when. Sometimes there are scales on the trees when they were set out, and in three years from that time the tree will die if nothing is done to destroy the scale. It will die before it is large enough to bear any. I have known them to be killed within three years from the time they were set out, when there were only a few scales on at the time they were set out. Sometimes you can hardly notice them.

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Mr. Kingsbury: What is the first appearance of the disease?

Professor Troop: A general withering up of the tree. The insect gets its beak into the bark and sucks out the juice or sap, and in this way sucks the life out of the tree.

A Member: I should like to ask the Professor if he can give us any new thoughts on the blight. That is almost as important as this.

Professor Troop: Nothing new. "Cut it out and burn it."

Mr. Kingsbury: I noticed some time ago that it was stated that there had been a parasite discovered and brought to this country which would destroy the San Jose scale. I have looked in vain for any further information on that point.

Professor Troop: Agents were sent to Japan and China for the purpose of finding out where the native home of the scale is, and also for the purpose of finding out if a parasite could be found that would kill it. A lady bug was found in China that fed on the scale and held it in check so that it didn't do very much injury there, and some of these lady bugs were imported, but I was in Washington a couple of weeks ago and I was told that they had practically given up that as a failure because the bugs didn't seem to stand our climate.

Secretary Flick: I have a resolution here which I would like to offer on the subject of the State Entomologist—

Resolved, That we petition the General Assembly at its next session to make a sufficient appropriation for the State Entomologist to enable that office to wage a successful fight against the insects which are now causing hundreds of thousands of dollars' loss to the fruit and farming interests of the State, and which seriously threaten to destroy our orchard, park and lawn trees and ornamental shrubbery.

Professor Troop: I move the adoption of that resolution.

Mr. Zion: I second the motion.

Professor Troop: I hope that this resolution will pass, and that the various members of the society will act on it and before the next Legislature meets that the members elected will be informed of the importance of this work. That is the only thing that is necessary. If they understand the importance there would be no question about getting the additional appropriation. I asked for two thousand dollars additional last winter, but the chairman of the Ways and Means Committee informed me that they had given the Horticultural Society a

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big increase, and that we had better go to them for any additional funds necessary. I explained that that was an entirely different department and affair, but we have got to have this society back of everything of that kind in order to make it go, and so I hope that the members of the society will take this matter to heart, and make their respective members of the next Legislature acquainted with it.

Mr. Walker: I am not a member of this society, but I would like to ask a question. I would like to ask the Professor if he has found uniformly good results in his experience and observation in the use of lime and sulphur and salt wash to control the scale, and if not, to what he attributes the lack of efficiency at times.

Professor Troop: Where it has been properly mixed and properly applied I do not know of any instance where it has not given good results. Like everything else, if not made properly it will not act properly.

Mr. Walker: What failures have you found in its preparation?

Professor Troop: I can not name any of the particulars now, for I haven't them in mind. I only know that certain persons have not had good results by using it, but as I have said, it is like everything else—if not made right it will not work properly. I see Mr. Reed is here, and he has had some experience in using it.

President Stevens: This is foreign to the matter before the house, and we will take it up later. We want to talk on this resolution.

Mr. Zion: I would like to ask Mr. Troop how he proposes to spend this money. I have an orchard of fifty acres, and if he proposes to come in and spray my orchard to kill the scale all right. I do not know just what his plans are to make it practical, unless he is going to do that kind of business. I would like to ask the Professor in what way he proposes to spend the money. I am decidedly in favor of it if he will go into the orchard and kill the scale. I would use salt, sulphur and lime. As a matter of fact, there is not an experimental station in the United States but what advocated that long before we talked about it. It is nothing new, and for a man who has an orchard of trees and knows that he has the scale, it seems to me that he ought to fight the insects himself, and if he has a small orchard or two or three or four, or eight or ten trees and expects the State Entomologist to come and spend twenty-five or a hundred dollars, I do not know whether it would be a very good expenditure or not. I am in favor of fighting the scale in every manner now. The most necessary thing is to find

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the best way. I have been waiting to see if we could find the best way of fighting this insect and probably Professor Troop has outlined the best way. If he has and this is the best way, I hope everyone will support it.

Professor Troop: I will say that if I had the means, and knew that Mr. Zion had the scale, and that he did not take the matter enough to heart to himself make the application, I should send a man there and make it for him. Now, my plan would be the same plan that is used in Illinois and Ohio. I would have experienced men employed to do that work, and I would send these men into the infested localities, for instance to Columbus, and to Vanderburgh County, where the whole country is covered with the scale, and send a man into every locality with machinery and material and let him stay there and assist the people and show them how the remedy should be mixed and assist them until they were able to apply it themselves or until the insects were cleared up.

Mr. Snodgrass: While I am in favor of the resolution, I do not believe that it is hardly strong enough. In fact, I do not believe it covers the ground. I believe the resolution should go into the hands of the committee and should be gotten up in a form that will cover the field better than this one. Now, there are a great many different kinds of insects to be fought, and there are a great many different people interested in fighting these insects, and we should not adopt a certain policy of fighting insects without a thorough understanding of those who are interested in it. So far as I am concerned I think that everyone should be compelled to take care of his own orchard and bugs and insects. I think there should be a law that compels men to do this. I think the main thing that we want now is a law compelling every individual to destroy his own insects. I have realized for a number of years that if everyone was compelled to do this the time would soon come when we would have no necessity for spraying for bugs, so I believe this resolution ought to be put into the hands of a committee and gotten into a shape that will cover the field better than the one that has been offered.

Professor Troop: I should like to say another word. Indiana has a law on this subject, just as good as any State in the Union, if I did have something to do with the framing of it. I was at Washington three weeks ago attending the national meeting of fruit inspectors, and it was brought out there that our law was as simple and effective as any law in the United States, and a great deal more so than most of them, for my opinion is that the simpler you can get a

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law and have it effective the better it is. And I believe that if this law was lived up to, if the persons who are in charge would enforce it. we have all the law that is necessary. I think that others who have given this matter attention will say the same thing.

Mr. Kingsbury: What does that law provide in this matter?

Professor Troop: The law provides that the Entomologist shall notify the party and that it is then their duty to apply the remedies as suggested.

Mr. Tillson: It seems to me that the intention of the resolution was right, but it should go to a committee. All that is before the house is a motion to adopt that resolution. I do not think we ought to adopt that resolution; we ought to send it to the committee.

President Stevens: The motion was to adopt.

Mr. Tillson: Yes, we do not want to adopt it until we are sure it has been thoroughly investigated. It is important. I think it should be referred to a committee and let them go through it and report it back.

President Stevens: I would suggest that the motion be withdrawn, and that it be referred back to the committee.

Secretary Flick: So far as I am concerned that would be all right, if so desired.

(Motion to refer to committee voted on and lost.)

Mr. Snodgrass: Just a word. I do not want anyone to think that we do not want the resolution. We do. We did not want it killed in the committee, but we want it to come up all right. Do not allow it to be killed, and don't kill it, but bring it back, as we want it and must have it.

Mr. Swaim: I move you that this resolution be referred to the proper committee.

Mr. Snodgrass: I second the motion.

(Voted on and carried.)

President Stevens: Do you want it to go to the regular committee or a special committee?

Mr. Swaim: I don't know whether it should go to a regular committee on resolutions or not. They are appointed?

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President Stevens: Yes, sir.

President Stevens: I have a suggestion to make along this line, and that is, we want a committee appointed at this meeting to memorialize our next Legislature, and this can come along with that report. I think before our next annual meeting the Legislature will have convened, and before that we wish to present to each member of this Legislature a showing, in order that they may see what this society has to do, and along with that showing there should be a report on this resolution, for instance, stating what the society means, and what it would like to have from the State among other things, which would be a continuation of the appropriation, or possibly an enlargement of the same, and so I think at this session we should have a committee appointed to carefully go over these things and memorialize our Legislature on this line. I only offer this as a suggestion.

Rev. Smith: Would that have the effect of preventing a report of this committee to this body?

President Stevens: No; this committee would be instructed on this line and others.

Rev. Smith: As I understand it, we should hear from this ourselves? It is to be reported on before we adjourn?

President Stevens: I only make this as a suggestion.

Rev. Smith: Isn't there a motion before the house that has not been acted on?

President Stevens: That has been acted on and referred to the committee. Is there anything further to come up before us now?

Mr. Kingsbury: Mr. President, is the committee already appointed to whom this resolution shall be referred?

President Stevens: No, but that will be done before we adjourn.

Mr. Kingsbury: It seems to me that it would be important to instruct the committee to confer with the State Horticultural Societies through their secretary, of Illinois and Ohio, and learn from them what effect has come from a large appropriation which has been made for this purpose, and if the effect has been marked and all right, there would be no difficulty in getting the appropriation from our Legislature.

Mr. Hobbs: I would like to say in this connection a word in connection with the thought which was given a few moments ago by the President. This society appointed a legislative committee last year, and

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it appeared before the Legislature and secured an appropriation, and possibly that committee ought to report. Some time during the session of this body I think we should report what was done, and I think that the wise thing to do would be to appoint a committee to appear before the Legislature to look out for this appropriation for the State Entomologist, and other kindred interests.

President Stevens: Do you think this committee ought to memorialize the Legislature or have a different committee? I should think it would be hardly necessary to have two committees when one might do the work. Then I will name the following persons:

Mr. Hobbs, Mr. Kingsbury and Mr. Snodgrass.

The meeting will now stand adjourned until 1:30.

WEDNESDAY AFTERNOON SESSION.

Vice-President Swaim in the chair: The meeting will now please come to order. The first thing on the program this afternoon is the annual address of our President, Warder W. Stevens.

PRESIDENT'S ADDRESS.

Since our last annual meeting the State Legislature has seen fit to increase our appropriation, which places us under increasing obligations to discharge our duties faithfully and render more efficient service in the matter of developing the horticultural interests of our great commonwealth. The Creator, in divine wisdom, ordained that man should work, and dignified and blessed the first of the race by making him a horticulturist. Society today is largely kept sane and sweet by the men whose privilege it is to live and labor in God's beautiful outdoors. It is an interesting fact that large numbers of successful men in the bustling life of our great cities carry to those busy marts something of the freshness and beauty, the abounding life and tireless exhilaration, the sound morality and high moral purposes of the farm. What an opportunity has he who works amid the fruits and flowers and gardens to meditate and muse upon the higher themes that constantly knock at his door and demand his attention.

STATUS OF FRUIT GROWING IN INDIANA.

While the fruit industry of Indiana has not made as rapid development in the past few years as many had hoped for, still there has been a steady progress all along the line. It has been demonstrated that

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fruits, particularly the apple and most small fruits, may be grown successfully for home use in all parts of the State, and that on at least one-third of the State's area commercial fruit growing may be carried on successfully, yielding profits far in excess of those realized by those engaged in growing grain and breeding stock. Many orchards can be found in different parts of the State that are giving annual yields of $150 per acre, and small fruits running up to $500 per acre. With proper care, cultivation and spraying, a failure of the apple crop seldom occurs in what is known as the fruit belt of the State. The time was when the general farmer could plant an orchard, give it no care, produce good crops of fruit and sell the same at a fair price. Now, if he kould realize any profit from the orchard, it must receive the same careful attention that is given any other crop. The present tendency is for the general farmer to give up commercial fruit growing, and in many instances even the growing of fruits for family use, leaving this to the specialist who can and will give it the proper attention. We are pleased to make note of the fact that the commercial planting of orchards is being extended considerably at present, in some parts of the State. The best energies of this society should, in the main, be directed to the economical distribution of the State's annual appropriation along the line of developing commercial orcharding and fruit growing, with the end in view of supplying home demands at least, instead of importing so much of the fruits we consume. In the capacity of a public servant and distributor of public money we must ever remember that we are laboring for the good of all and not for our own personal aggrandizement.

MORE EFFECTIVE WORK.

Since our last meeting the Executive Board has deemed it advisable to keep some one in office at the State House every day of the week and has made arrangements accordingly, prescribing certain duties and labors for the assistant, who works under the direction of the Secretary of this society. To advertise the fruit interests of the State, to invite capital and experienced fruit growers from other parts of the country to join us in the work of developing our resources and awaken a new interest in horticultural pursuits are the objects that are in the main to be accomplished. To systematize this work and put it on a more effective basis should be made a matter of special consideration at some meeting of the Executive Board during this meeting. We must make a showing of faithful, progressive work if we expect future legislatures to continue our appropriations or increase the same as necessity demands.

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SOME SUGGESTIONS.

An effort is now being made by all interested parties who ship and handle perishable products for the incorporation, in whatever rate bill may ultimately pass Congress, a feature that will regulate the icing and handling of refrigerator cars, and, as much of our fruits are shipped in refrigerator cars and we are all more or less interested in this matter, we should take action by proper resolution to do our part to secure relief from the burden of excessive charges that all shippers are compelled to bear.

Inasmuch as we all feel the need of a fine, showy, well-flavored and late keeping winter apple—in short, a winter variety that meets all demands—I would suggest that this society offer $1,000 to the producer of a winter apple as highly flavored as the Grimes Golden, as beautiful as the Snow and as good a keeper as the Grindstone, or some similar qualification. Such an apple would be worth millions of dollars to the orchardists of the State. We are striving to produce such an apple in our experimental orchard, but this stimulus might possibly give it to us through private effort in shorter time.

If the largest profits are to be realized from the fruit industry there must be co-operative work among the growers of every neighborhood or shipping point. A good spraying outfit will do the work for a half dozen small fruit growers, and in the marketing of fruit products co-operation enables any individual, from the smallest cottager to the largest fruit grower, to dispose of his products at the minimum of expense and the maximum of profit.

If we read the signs of the times aright our common schools are to be made more practical by imparting knowledge that will harmonize with the demands of practical life. This society, by proper effort, can do much to hasten the day when our children will be taught the elementary principles of agriculture, horticulture and domestic economy in our common schools. We are more particularly interested in the future horticulturist, and to have him develop with sufficient knowledge and enthusiasm to make his calling a complete success, instruction should begin in the school garden. It was undoubtedly a mistake to establish our State agricultural and horticultural colleges without preparatory schools leading up to them. The remedy now is to begin with the school garden in the common schools, go from thence to county agricultural and horticultural high schools and thence to the colleges, if deemed expedient. To reach the masses we must carry the schools to them, instead of trying to carry them to the schools, when time and means make it impossible to do so.

The school garden idea is not a new one, for we find it stated

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that the elder Cyrus, king of Persia, 559 B. C., established the first school garden, in which the sons of noblemen were instructed in horticulture. The Italian and other universities of Europe had their school gardens as early as 1600. In later days Sweden took the lead in the establishment of school gardens, beginning the work in 1869. For the past twenty years all elementary schools in Belgium, Switzerland, France and Germany have gardens, and in most every instance the instruction is made compulsory.

In our own country, Wisconsin, Missouri and Michigan have made some advance in establishing such gardens in connection with the public schools. The plan of having school gardens is a most natural one, and during the next quarter of a century we shall wonder how the schools ever have got along without them and been true to their purpose, which I take to be the all-around development of the child as a useful, successful citizen and homemaker. Manual training, from the limited beginnings and narrow applications of the present day, will broaden gradually to include instruction in housekeeping, vegetable gardening, agriculture and horticulture. Child nature will be developed and instruction will go far toward giving every child the ability to earn a living and make a success of some honorable, useful occupation.

The most effectual way to avoid the temptation to wrongdoing is to fill the mind, the heart and the life full of rightdoing. The inculcation of good manners and good morals will be the inevitable result of this thorough development of the whole nature of the child to be realized in the school of the future. And for the part that horticulture will take in the work and the moral lesson it will teach the child, let us listen to these words of Henry Ward Beecher:

"The sun does not shine for a few trees and flowers only, but for the wide world's joy. The lonely pine on the mountain top waves its dark boughs and cries, 'Thou art my sun!' The grain in the field calls out, 'Thou art my sun!'

"God sits glorious in heaven, not for a favored few, but for all; and there is no creature so poor or so low that he may not look up with child-like trust and say, 'My Father, Thou art mine!' "

Vice-President Swaim: Our usual course is to refer the President's address to a committee for consideration. I will therefore appoint—

A. W. Shoemaker, E. Y. Teas and J. C. Grossman.

President Stevens: The next thing in order is the report of the superintendent of the Experimental Orchard. I understand that Mr. Burton was unable to be here, but his son is here, and has the report, which he will read.

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REPORT OF SUPERINTENDENT OF EXPERIMENTAL ORCHARD.

JOE A. BURTON.

Mr. Burton, Jr.: Mr. President, Ladies and Gentlemen—

About 800 seedling apple trees were grown this season. Most of them were from seeds saved up at the World's Fair from the exhibits of the various States. These vary in height from one to twenty-four inches. They were given very thorough cultivation during the forepart of the season, but made very little growth. I concluded the ground was too loose and stopped cultivating. Shortly after that they became much mildewed. After a thorough spraying they commenced to grow. and some grew fine.

Only two trees in the nursery rows bloomed. These because they were injured by the groundhogs. One carried about a dozen apples to near maturity, when someone carried all away but one. The tree was too much weakened to properly develop the fruit. Four topmarked seedlings bore, two to maturity, one nearly so. One, from a Ben Davis seed, was sweet and of poor quality. One, from Salome, was of good quality and worthy of further trial. One, from Rome Beauty, was quite promising in tree, form and appearance of fruit, and extra quality. It is fine-grained and a little nearer sweet than its parent.

Quite a number of the trees in variety plat bore. Most of them gave negative results; that is, showed the varieties to be undesirable. I have steadfastly objected to planting those varieties that had no special claims, but the committee in charge insists that it is as important to show what won't do as what will. If this be the purpose we have surely had magnificent success. The Northwestern and Gideon varieties come under this class. I am aware that Duchess is highly prized by many, but here it has, so far, proved a failure. It is a special mark for the curculio and the woodpeckers. The rare specimens that are perfect are far inferior to Transparent or Benoni. The famous Patton Greening that is attracting so much attention in the Northwest gave specimens fully twice as large as shown by Mr. Patton himself at Kansas City, but they are as sour as re-enforced vinegar. Florence Crabb is an abundant bearer and probably the most beautiful of all apples and is excellent for jelly. However, it would not sell in our home markets. Shipped to Indianapolis it was reported sold at 75 cents, when Transparent was selling at $1.50. Stayman gave a few specimens both in the Experiment Orchard and for Burton Fruit Company. While de-

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ficient in color they were almost entirely free from depredations of insects and fungi. They seem to be very late. Specimens are herewith shown for the society to test quality.

The Japan plums bore abundantly and were of good size and appearance. We tried to sell them in our home market, but could not. Then we tried giving them away. This was only a partial success, for they would not come a second time. Most of the crop finally wasted. They might be called the Ben Davis plum.

RESULTS FROM EXPERIMENTS.

Two trees top-marked to Ben Davis in 1902 with cions from nursery rows and from bearing trees bloomed freely on both kinds of cions. Yellow Transparent from bearing twigs and water sprouts, bloomed freely from both. Grimes grafted in 1903 from an annual and a shy bearer. One limb of shy bearer full of bloom. None of these produced fruit.

FINANCIAL STATEMENT,

Money on hand		$35 10
Money spent for stationery	$3 35	
Spent for expressage on trees from Stark Bros	35	
Spent for apple and peach trees	11 00	
Total expenditures	14 70	
Balance		$20 40

President Stevens: I will say that Mr. Burton is familiar with the work of the Experimental Orchard and if anyone has any questions to ask you may ask them of him, for he can answer them quite as well as his father.

Mr. Burton: And if I can't, I'll call for your assistance, Mr. President.

Mr. Zion: I think if questions in conformity with that report were asked it would be very unfavorable to the society. I think that was a very unfavorable report. We must be experimenting with the soil and climate, or else we would not continue that experiment station. Everything that has been done there has been done better many other places in Indiana. We must be experimenting with that soil and climate. Surely any other part of the State of Indiana will do better than that, and surely we would not have to make a report like that. I move you that the report be accepted, but I do hope we will be able to get a better and more favorable report from the station next year. It will become a serious question for this society to decide whether or not it can continue it. It is about the same kind of a report as we had

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last winter. I fear that a great many people will think that Indiana is a very poor place to grow fruit, and that the Japan plums are a failure in the State of Indiana. They are good plums and are of the best in the State. Those people who have tried them and used them have found out that they are the finest plums that grow. I did not expect to make a talk on this, but I do hope we will get a more favorable report from the station next time.

Mr. Henby: Of course I am one of the members that opposed the establishment of this experiment station, and I believe that the money that is expended in trying to run it and discover new varieties could be much better spent in restoring our old varieties, by restoring our soil to its former condition. If this society would give its attention to that we would, I believe, accomplish much more than we will at the station in trying to bring about new things. Of the new varieties of apples originated in the last thirty or forty years, ninety-five per cent. of them are a failure and should be discarded. Take the old varieties of apples and give us the soil that we had in earlier days, and see what we can do. You will find that all over this State in different neighborhoods, these old trees are doing well. You will find the Yellow Bellflower, the Rambo, Rome Beauty and other such apples the finest ever. Why not get after these grand old varieties and find trees that are succeeding well and plant them in our experimental station and propagate from these trees. We should experiment with the soil and get it back to where it once was, to a rich alluvial soil. We should supply the ingredients that we had when we raised these apples. Think of the Golden Russet, and the Spice apple. You may mention ninety per cent. of the varieties which have originated within the last thirty years and I will convince you that none of them will compete with the old varieties, and they should be discarded from the list. This is my proposition. I believe this society is making a serious mistake in spending our money in the way in which it is in trying to bring about unforeseen things and things which do not exist and perhaps never will.

Mr. Tillson: I think we have a committee that was appointed to visit the orchard, and we should like to know what they have to say.

President Stevens: We will have a further discussion of this subject when we hear from the committee. We would suggest that the committee give us a report tomorrow morning as to what has been accomplished, and what their observations have been. I think we might leave this subject until we have a report from that committee.

We will take up the next subject, "Melon Growing in Indiana," by W. C. Reed, of Vincennes.

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MELON GROWING AND ITS PROFITABLENESS.

W. C. REED, VINCENNES.

Very few people realize the extent of this industry, the value of the crop or the acreage grown in the State of Indiana. In the year 1904 there were 11,210 acres of watermelons and 4,798 acres of cantaloupes grown for market. Of this amount Knox County produced one-fourth, or 2,940 acres, of watermelons and 1,260 acres of cantaloupes.

Gibson County also produced one-fourth, or 2,229 acres, of watermelons, and 2,068 acres of cantaloupes. With the exception of Daviess, Starke and Sullivan counties, which produce about 1,000 acres each of melons, the balance of the 16,000 acres are scattered over the State in small lots, varying from 1 to 500 acres in the different counties.

The majority of these melons in this vicinity are grown on ground that twenty years ago could have been bought for $10 or $12 per acre. Today this same land is renting from $8 to $12 per acre cash rent, and is not for sale at any reasonable price.

The most of this land is thin. The increase in the value of the land alone will show that the business has been profitable. Melon growing, like fruit growing, has its ups and downs, and its off years.

The crop of 1904 was not as profitable as usual, owing to the cold, wet season and the quality being a very low standard. This discouraged some growers, and like potato growers they cut their plants and the acreage of 1905 was very light compared with the year before, being only a little over 11,000 acres total plants for the State.

Owing to the short acreage this season and a very satisfactory yield the growers have made as much if not more money out of this year's crop than they did in the crop of 1904.

The growing of the cantaloupe has been the most profitable for the careful grower, who starts his melons under glass and has them ready to bloom when they are transplanted to the open ground.

From the best information I can gather from practical growers and the shippers in the State the crop is about as follows:

Eleven thousand two hundred acres watermelons on an average produce about one-half car per acre, or 500 melons; the price from $60 to $100 per car and a total of $500,000 to $550,000 for the crop. And 4,798 acres of cantaloupes on an average produce 300 baskets per acre, worth $75 to $100 per acre, or a total value of the two crops of about $1,000,000.

This estimate is based on the prices paid the grower on the track at shipping points, and we have endeavored to give a careful average,

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although there are a great many growers that have made more money per acre than the above figure, and yet often the cantaloupe yields as high as $500 per acre f. o. b. shipping point. This of course, in the hands of the best growers. A great portion of the crop is sold before being shipped and commission men running all the risk of the falling market.

While this year's acreage has been low, yet with the high price received I think the value of the crop would be about the same as 1904.

In this paper I have only endeavored to show the extent of the industry, and as this is to be followed by a paper from Mr. Yates, who is a practical grower, having been in the business for quite a number of years, both growing and shipping, he is better able to give you the exact results than I am, as I have never grown any melons and have only collected what information I have from other growers and shippers in this vicinity and adjoining counties. Also from the report of the State Agricultural Department.

President Stevens: We will now take up the subject of "Some Experiences in Growing Potatoes for Market," by J. M. Snodgrass.

SOME EXPERIENCES IN POTATO GROWING.

BY J. M. SNODGRASS, CLINTON COUNTY, INDIANA.

Mr. President, Ladies and Gentlemen—The first thing that is necessary for a good potato crop is a good, deep, well drained soil. This is the foundation on which you expect to build the crop, and without this all your time and labor will be lost, and you must not forget that in order that the foundation be perfect you should strengthen all of the weak points. The soil should not only be deep and well drained, but it should be rich, and if it is not already rich it may be made so by the application of about 20 loads of stable manure to the acre. However, manure should never be hauled on the land when it is wet. In the fall or winter when the ground is frozen is the best time to apply manure to land that you expect to put in potatoes the following season. And now if you have a good, deep, rich and well drained soil, any place in Indiana, you have the best kind of a foundation for a good potato crop.

Breaking the Ground.—Early in the spring, as soon as the ground is thoroughly dry, start the plow, and plow narrow and deep, and if your ground is in the proper condition it will turn over loose and friable.

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and land thus broken is very easy to get in order for planting. A good seed bed I have found to be very essential in producing a good crop of fine merchantable potatoes. However, some of you may ask what I consider to be a good seed bed for potatoes. My experience is that the seed bed should be about eight inches deep and thoroughly fined clear to the bottom. I do not want any clods or unbroken soil to hold the fertility and retard capillary attraction. This fertility and all of the water that you can get will be needed when the tubers begin to form. In preparing land for potatoes care and good judgment must be used. Never work the soil when it is the least bit wet; see that it is dry and friable clear to the bottom. Many make the mistake of working their land too soon after a heavy rain, thus packing the under soil, and doing it an injury that will be irreparable, so far as the present crop is concerned.

The Seed.—The selecting of the seed is a very important matter; we can not be too careful when it comes to the selecting of the seed upon which our success is so dependent. I would not undertake to tell you what would be the best variety to plant; you will have to decide this by experience. A potato that will do well in one locality may be a failure in another, and a potato that will succeed in one kind of soil may not do as well in a different soil. About the best way to decide this question is to have an experimental plot for the purpose of testing the different varieties. I like to try all of the new varieties that are introduced, but I want to touch them very light at first. The commending features about this plan are in the fact that when you have discovered a good variety you have also received a thorough drill in its habits, which will be of untold worth in its future cultivation.

Do I treat the seed for the scab? Yes, this is a very prevalent disease in my section of the country, and I have had no small loss on account of it. Some of my greatest failures can be attributed to the scab. Never plant a potato without treating it for the scab; it may not show any appearance of the disease, but the treatment is so cheap and so simple that you could not afford to take chances for the small outlay of time and money that it would cost.

The Treatment.—Take two ounces of corrosive sublimate, dissolve in a quart bottle filled with warm water (for a treating vat I use a half of a coal oil barrel). Add this to 15 gallons of water—rainwater if you have it, but well water will do—fill a bushel basket with potatoes, place the basket in the treating vat, see that every potato is immersed, and let stand for two hours; take out and spread out to dry, repeat the process until all have been treated.

After the potatoes have become thoroughly dried, with a narrow,

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thin-bladed knife cut in five pieces as near as possible and if time will admit let them dry a few days before planting.

Now I have my land prepared and the seed ready to plant, if you have no planter the next thing to do is to furrow the ground. This I like to have done with a good long and wide shovel plow, one that will throw out a clean furrow as deep as it was broken. This gets the potatoes down to the solid ground, where the roots can get the greatest benefit of the moisture, and yet have a loose soil for the tubers to form in. The furrows should be made as near thirty inches apart as possible; this is about as close as you can cultivate and as far apart as the vines will cover the middles. I have found this to be a great deal of benefit during a drought.

Planting.—This is another feature of the work to which I can attribute a few failures. In planting a great deal may be done toward the subsequent cultivation of the crop. My old method was to cover with the plow, throwing a furrow from both sides, toward the row, thus making a ridge that the sprouts were very slow in getting through, and when they did come up they were small and spindling; and then when I went to cultivate that ridge was always in the way, and if I used the harrow it was sure to drag out more of the potatoes than I cared to dig at that time. The only way to get rid of that ridge was to take the hoe and hoe it down, and if I did not do this there were always more weeds than I cared to have in a potato field that I had control of, and then again it made more hoeing than I cared to do. While the hoe is a very necessary tool, and one that is indispensable for some purposes, I am always glad to lay it aside for a more speedy tool.

I drop the seed about twelve to sixteen inches apart, two pieces to the hill, and cover with the hoe two or three inches deep. Potatoes covered in this way will come up quicker, stronger and much more uniform. It leaves the ground in the very best condition for the cultivation of the growing plants. The surface is rough and uneven and will not bake, nor will it be hard to work down level with the spike-toothed harrow, which is the tool that I always use for the first two or three cultivations. This is the most speedy tool that can be used and yet do the work in a thorough manner. By the time that you get through with the harrow the potato crop is nearly tended, and will need but very little more work. It is certainly a most magnificent sight to look at a potato field at this stage of its growth, the ground perfectly level and the potatoes almost large enough to cover the surface. If there has been any hard rains the ground may be somewhat hard; if it is I stir it with a one-horse five-shovel cultivator. This loosens the surface about three inches deep, and the only tool that I use from now

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on is a light 14-spike toothed cultivator that I call the Irrigator, which does not work the surface over two inches.

Spraying.—Now if it were not for the bugs I would rest easy until digging time, but the bugs are here to stay, I suppose. Anyway, they will stay until we get a law passed to compel everyone who plants potatoes to destroy his bugs. I have always used a common garden sprinkler. However, next season I will use a force pump with cart and horse, and spray four rows at a time. The garden sprinkler is a little too slow where one has a large area, yet it can be highly recommended for thoroughness. Two sprayings are usually enough; however, last season I had to spray the third time before I got entirely rid of the pests.

I suppose that someone will want to know if I spray for the blight. Although some of you old potato growers will probably criticize, I will be compelled to answer, No. I have not been bothered with the blight except during one season, when it was unusually wet. There was one variety that blighted when the tubers were about two-thirds grown. However, I will use the Bordeaux-Paris green mixture next season. The expenses will be so small that it will not justify me in taking the risk.

Digging.—Now, if we have a good crop, the fun of it all is in the digging, and if the above method has been followed out the yield will be a satisfactory one; unless the season has been an extraordinary unfavorable one. I am not to advertise any special brand of diggers; however, I am using the Rock Island, which does the work in a most thorough manner. I use crates and pick the potatoes as soon as they are dug, not letting them lie in the sun any longer than can be avoided, but haul to the shed and let them dry in the shade. This keeps them sweet and nice and it will be a commending feature when they are taken to market.

Grading.—This should be done by hand, because there is no machine that will take out all of the cut, knotty or green ones, and these will have to be taken out if the top of the market is to be expected. Let me speak this with emphasis. Never on any account market potatoes without grading them. A few small or faulty potatoes may spoil the entire lot. Remember that if you do not grade the other fellow will, and not only will he take out all of the inferior stock, but he will take out enough of the good ones to pay him for his trouble.

Profits.—This is a part of the business that precedes all of the others. If there is no profit the business of growing potatoes will lose all of its charms. However, the profits are not so large as to cause men to tumble over one another to get into the business and cause a glut in the market. I want to say this, however, that there is a living in the business for the man who is willing to enter into all of the details

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of the business. I have made a fair profit at it, and what I have done others can do. The expense in growing and marketing a crop of potatoes has ranged from $30 to $35 per acre, including the rent of the land, which I estimate at $10 per acre. The gross receipts has been from $50 to $100 per acre.

Summary.—There is a fair profit in growing potatoes for the market, if you have a good, deep, rich, well drained soil, good tools in the hands of a man that knows how to use them and knows enough to do it; good seed, properly treated for the scab; all of the little details of planting and cultivating strictly attended to; spraying for the potato beetle, carefully dug and honestly sorted before marketing. All of this, coupled with advice of experienced growers, experimental station reports, practical experience and good judgment, will bring ultimate success.

Mr. Kingsbury: What is your average yield?

Mr. Snodgrass: About two hundred bushels.

President Stevens: We will hear from Mr. Garretson first.

A Member: I think Mr. Garretson was called to Texas by sickness. He started there yesterday morning.

President Stevens: Then we will take up the discussion of this question. Has anyone any suggestions to offer?

Rev. Smith: I would like to ask if he would furrow the ground out and let it dry before he plants, or let the sun warm it, or if he plants right away.

Mr. Snodgrass: We aim to plant right after the plow; it makes it nicer. If the soil is not moist the potato will not come up as well. I have tried the other way, but I have thought this was the best method. We do not put enough dirt on them but what the sun will warm down to the potato. About two or three inches is as much dirt as we put on the seed.

Mr. Hazlett: I am interested in this and you will please pardon me if I ask more than one question. I come to this meeting to hear this subject, and I came for information, and I would like to ask if you discard the blossom end in planting.

Mr. Snodgrass: I discard nothing.

Mr. Hazlett: I should like to ask you this: If you take a small potato, say the size of a hen's egg, how would you cut it?

Mr. Snodgrass: I would not make the pieces too small. I know persons who have discarded the blossom end and I have tried it, but

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I have never profited by it. I noticed when I did that the blossom end was from three to four and even more days ahead of the other. If you will notice it, when they are planted strictly by themselves they are ahead, but in the product there is no material difference.

Mr. Hazlett: I should like to ask another question: Do you turn your manure on the bottom of your furrow?

Mr. Snodgrass: We have been using the joiner, but I like the manure mixed with the soil all the way through.

Mr. Hazlett: May I ask if you use a commercial fertilizer?

Mr. Snodgrass: We haven't used any. The occasion has never demanded it, although I have thought that I would experiment with a commercial fertilizer.

There is something along this line that should be in my paper in regard to planting different-sized potatoes. I have planted both large and small potatoes. I have never cared for the extra work, but I have noticed that it made a noticeable difference in the product. I frequently plant all small potatoes, those which are not marketable, and I have planted them alongside of the larger selected potatoes which we have been saving for seed. I never liked the idea of saving seed from small potatoes, for some reason or other, but I never carried the experiment to the point where there was any difference in the fruit. In my opinion there is a tendency in the small potato to reduce the size of the potato.

Mr. Hazlett: I want to ask you what kind of soil you have—whether clay, gravel or black loam on which to grow potatoes?

Mr. Snodgrass: We grow potatoes on nearly all kinds of soil, but our best soil, or the soil that I have found best after a great deal of experimenting, is our black soil. We grow better potatoes on black soil than on the lighter land. It retains moisture a great deal better, and in the second place it will not become so packed after hard rains. Our clay soil is not like some soils where it is all clay. Our clay land in our part of the country is what is called "jug land," and the reason we call it this is because it is very compact and runs together and holds water like a jug, and unless we fertilize very heavily we can not raise potatoes on it with any degree of success, but our black land is our best potato soil, and I never discovered that until the last few years.

A Member: I do not agree with him on the way he uses the manure. I would not put it on the field before breaking without it is in

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sod. I would plow the ground, get it ready, and put the manure on the top and work it in. After the ground is in pretty good condition we put fifteen loads to the acre and harrow it in.

In selecting my seed I want to select the nicest, smoothest potato I can find. If this is true about corn, why not about the potato? We surely ought to grow the best commercial potato in this way. I planted small potatoes one year. Another thing, I used a formaldehyde preparation this year, and dipped the potatoes, which were in an old coffee sack, before I cut them. I think in this way I will not have so many scabby potatoes. I tried this for my own benefit this year and I think it is a success. I am a great hand to let the manure be put on the ground in the spring if the ground will do, but certain kinds of ground you can never get dry enough to work for potatoes. This is the reason I do not like it. If you get the ground nice and dry and put the manure on and rake it in it is always nice.

Mr. Ratliff: Some persons advocate large potatoes. I differ from them in more than one way. When I was attending college at Purdue, experiments were being conducted, and being one of the members of the class, I had an opportunity to observe the work, as well as to assist with it, and after the experiments were over the piles of potatoes were photographed, and we had a graphical representation of what the yield would be, not only from a single hill but from several hills. After leaving the University I was imbued with the same ideas and began to plant small potatoes, and my neighbors concluded that education was of no avail, and thought, like some here, that I would have no potatoes from the running out of seed. Not being egotistical, but we have succeeded in carrying off the first premium in every instance for a number of years, and our potatoes were grown from the smallest ones in the lot. The reasons for planting these are several. The first reason is that there is a tendency for the cut piece to rot in wet weather, or wilt down in dry. I have had cases when we hadn't a good stand and have examined and found wherever a potato is missing it is nearly always the cut potato that has rotted, and another important thing is that you save your wife a great deal of trouble. We sort the potatoes and let the women folks have the largest ones, and what they do not use we sell, and then another thing, you can plant without cutting, and as a result you will not be disappointed in the yield. Everyone has his own idea in regard to the soil for the potato, but our experience has been to make the soil rich and the results will be better.

Mr. Shoemaker: I have had an experience this year in my potato field which perhaps might be of advantage to some here. I planted for

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my own instruction a number of rows, about one-third of eight acres, in small potatoes, as the last speaker suggested. I selected those about the size of a hen's egg—or about the size of a walnut—and among those I planted potatoes cut to one eye. I did this for my own instruction, thinking that if the small potatoes did as well I would use them and save the expense of cutting the larger ones. On account of the rush at this season of the year, we have to pay pretty high to have this done; and also, because the small potato is unmarketable, but we can find a market for the larger one. But my experience is that notwithstanding all these reasons, if this year is a good guide, I will never plant so again. I will hereafter plant the larger potatoes, not always perhaps, but I feel that I should. The vines were very thrifty, and for forty or sixty rods away you could tell just where they came to. They covered the ground much sooner than those in the other part of the field did. I was encouraged and I thought up to the time of digging that the thing to do was to plant the small potato, but when I came to digging them I was disappointed in them so much that unless other experiments shall prove to be different I shall not try it any more. I found that there would be a large number of potatoes in the hill, but they were very much smaller and unmarketable, but the others were very satisfactory.

Mr. Kingsbury: We have with us Professor Taft, from Michigan, a potato growing State, a State from which we get our potatoes when ours fail, as they frequently do, and I should like to hear from him on this subject. He is to speak tonight, of course, but this is a different subject.

Mr. Hale: In planting small potatoes many more vines will start than from the cut ones, but someone should be sent over the patch to pull out all but two to a hill. If you do this you will get good results. I have known of persons being paid $1.50 per day to go over the patch of small potatoes and thin them.

Professor Taft: I am a firm believer in selecting seed for potatoes, and I heartily agree with those who have spoken on the subject, but they did not go far enough, it seems to me. We believe in pedigreed potatoes in Michigan as well as in pedigreed plants. And I want to say that some of our most successful growers have followed the practice which I shall speak of, for a number of years, and it is their firm belief that the use of this plan has increased the yield at least ten per cent. per year for the last five years, and I know many who believe that practice has proved that it is worth what it costs.

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You make a mistake in waiting until the potatoes are dug to make your selection of seed. You should select them in the field, and the men of whom I speak make a practice of going out in the field before they are ready for them to be dug and select those which they think are typical hills, not extra vigorous ones, but from the very appearance to look as if they would furnish good seed. Those which are comparatively free from blight and insects. The result is a large number of fine potatoes that are of the desired shape, not extremely large, but good-sized potatoes. The trouble with some of these large potatoes for seed is that they come from a hill by themselves, and with the medium-sized potatoes possibly there were a dozen in one hill. I think there is a great deal in breeding the seed in this way. After you have had a good deal of experience you will come to the conclusion that a medium-sized potato is best. If I were allowed to make my choice of the eyes I would take the eyes toward the seed end, for I find they are stronger, and quicker, and are less apt to die than the others. It seems to me in years like this, even with the high price of potatoes, you can afford to keep these for seed. I would prefer selecting my seed in the field, and to select the medium-sized potato. I have tried many years with a great many varieties in which I have used from eight to ten or twelve bushels of seed per acre, and I got more than enough in the crop, as compared with four or five or six bushels, to make up the difference in the amount of seed used. I will say, however, that the better prepared your land is the smaller amount of seed you need use, and I would prefer to put in another dollar for preparing the land rather than to put that amount in seed.

Rev. Smith: I should like to ask Mr. Snodgrass one more question, and that is whether or not he considers corrosive sublimate the best article he could use for scab?

Mr. Snodgrass: I have never used anything but corrosive sublimate. When I find anything that will do the work I will not discard it for something I know nothing about. We can get it for twelve and one-half cents an ounce, and twenty-five cents worth will do for a couple of acres. I know that it is hard on your hands. In the spring my hands were burned, and in the summer they will crack, and they will not get over it until late in the season. I usually put the potatoes in a bushel basket and in this way save my hands. The handle of the basket will be above the liquid and you can lift them out on the drying board and save your hands. I have never tried anything but corrosive sublimate, and I don't think I shall as long as this is effective. We have had but little scab since we have used it.

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President Stevens: I desire to say a few words on potato growing. I have grown them for the market for two years. Ten years ago I followed the same methods which have been described here, but for the last eight or ten years I have pursued a different course. We have a clay land in the southern part of the State, and limestone land and rich loam, and in growing potatoes by the usual method of cultivation, with us, there are too many years that we have failures, so I have adopted the mulch method. As you all know, potatoes require a great deal of moisture, to insure a crop, and for that reason I always plow my ground in the fall. I have had experience in fall plowing, and if you have you will know that it will save the moisture until the spring, because of the freezing and the disintegration of the soil, so it makes it capable of holding more water or more moisture. I have a clover sod if possible. I never want to manure potatoes with fresh manure because of the increase of scab. I never put manure on unless it is well rotted, and then I want to get it into the soil tolerably well. I am in favor of planting good-sized potatoes, perhaps not the largest, for you can get a good potato from a comparatively small seed. In selecting our seed we choose good-sized, nice even potatoes. In the spring as soon as the ground can be worked I use the planter to lay off my ground in rows, make these rows two feet apart, and the hills twelve inches apart. I use the planter and about a thousand pounds of fertilizer to the acre, and I think it pays me in every instance. I use principally an acid phosphate. In some sections we do not need this. I have never yet had returns from the application of potash that paid me for the money put into it. Our land is a little old and has been cultivated for a number of years. Probably from one to two per cent. of ammonia is all right, but in the main I always have a clover sod, and that gives me the ammonia, and my fertilizer is acid phosphate.

As I have said, I plant as early as possible, and just as they come up I cover them over with straw about four inches deep; that is, when the straw has settled it covers the ground to that depth. I never have to go over the patch and cultivate it, and never have to bug it, for they will never bother strawed potatoes. I have never had a failure in the crop since I adopted this method. I never have to sort my potatoes, because they are all first class, and there are no little ones. I have the moisture there whether the season is dry or wet, for the straw keeps sufficient moisture to develop the crop. When I cultivated the potatoes in the usual way in our part of the State—southern Indiana—we had a failure about one year in three, and where I used to grow ten or twelve acres now I average from three to five

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acres, and I get more potatoes. Then it is less labor to grow potatoes in this way. I have never yet been bothered with bugs on strawed potatoes. This is my method and I have never yet had a failure in a crop, and I think it is a plan worth trying if you have the straw.

A Member: About what quantity would you use?

President Stevens: Cover them about four inches deep after the straw is settled.

A Member: What about the quality of the potato?

President Stevens: It is excellent. It is much better than in the usual way, for the potatoes are uniform in size and when you go to dig the potatoes you will find that they are mostly on the top of the soil, practically just beneath the straw. I think the quality is better than when grown in the usual way, because I get much cleaner, nicer, whiter, smoother potatoes, and they are much better sellers. This season with us was a very wet one, and I was afraid that there would be so much water that it would injure the crop and destroy the potatoes, but I could see no difference this year from the ordinary years. As I said, our soil is red clay, naturally well drained, and cavernous limestone. There is no surface water there to bother the potato crop.

Mr. Snodgrass: Some folks up our way practice strawing their potatoes, but we call that the lazy man's method, and like all other lazy plans it takes more work to get rid of the work than to do the work itself. We found the straw feature was not a success. I know of several instances where the potatoes rotted on account of the use of it, and I don't think from my observation, that it is any cheaper, for putting it on is more work than cultivating the potato

President Stevens: When did they straw their potatoes?

Mr. Snodgrass: They put the straw on them when they had finished planting.

President Stevens: That is where they made their mistake. They should have waited until they came through the ground.

Mr. Snodgrass: I used to have lots of trouble raising potatoes, but since I have been loosening the soil for about eight inches deep, and making the rows and putting the potatoes down that deep and then filling in on them we have not been troubled, and our potatoes have been making "good" right along. Planting deep is the only way that I find is successful. I am glad to know that there are other ways, but the experience I have given you is the result of several years' work,

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the result of a great many experiments and several failures. I have made many failures since I have been growing potatoes. I am now making a success in potato growing, and I think that is one thing which we ought to emphasize in this meeting; follow the example of successful men in anything we want to do. So while some of you may be successful in planting potatoes in different ways on your land, I want to say that in our locality it is a failure to use straw, and I would consider it twice the labor to straw a patch than to cultivate it.

As for manuring potatoes. I want the manure worked through the soil, until it is worked entirely through. I have never had any experience in using the shoveled plow. I never tried a commercial fertilizer; I suppose it would be worth something to us, for I think the land lacks potash, probably, and we are going to use it next year, but our manure has given excellent results.

President Stevens: I see that Professor Green is with us. He is from the Ohio Experiment Station, where this question has been studied thoroughly. Let's have a word from him.

Professor Green: I was thinking of saying a few words before I was called out on the potato. Of course no one can tell about the needs of his soil until he experiments, but there is one thing I believe in, and that is, that the potato must have a good supply of phosphoric acid. The theory has been that they need potash, and so they do, but in experiments we have been trying in Ohio, and I have kept watch of a great many others, we find that phosphoric acid seems to be good for them. In a few localities, potash also is required. We have found at the experimental station, and some of the other branch stations, that the increase we get from the use of phosphoric acid, in the number of bushels per acre certainly pays when for a dollar and a quarter of fertilizer we can increase our crop twenty-five bushels per acre. Of course I can not say that this would always work out, but I would advise you to try potash and phosphoric acid separately.

There is one point that I think is well worth mentioning, and that is the manner of growing seed. Much has been said about the selection of seeds, and what Professor Taft has said has been our experience also, and the only thing I want to add is this, we are carrying on an experiment to take the blight from the seed, and we are getting excellent results. In growing potatoes for seed the best plan that we have tried is one that is not new at all, but may be somewhat new in this locality, and that is to put the seed in the light and let them grow sprouts before they are planted. This has been considered excellent for growing

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early potatoes, especially in the Island of Jersey, where they make this a specialty. They put the potato in the light a month or two perhaps before they want to plant it. They get earlier potatoes in this way. From my own experience I am satisfied that this is the way to get early potatoes. But we have found that if we plant our potatoes about the first of July we get better potatoes for seed than we can get by any other method, and I believe it pays to grow potatoes for seed in this way. It is a little more work, but the seed keeps much better, and is much better than that grown in the ordinary way. The potatoes will be of medium size, but uniform and free from disease. There will not be scales and scabs on them, whether they are treated or not. If I were a potato grower I would practice this method of growing potatoes, even though it cost a great deal more. I believe that it pays to spray potatoes not only for bugs but for blight, and it doesn't cost anything extra. You can spray for both purposes. You should not neglect it. It is a form of insurance which one can not afford to neglect. Last season, and for more than one season, in fact, we have had in Ohio the late blight, and it has been very troublesome, and we gained thirty-six per cent. by spraying for the late blight.

A Member: How often do you spray?

Professor Green: I can not lay down a rule, but we would spray four or five times in a season.

A Member: What formula?

Professor Green: The ordinary formula or Bordeaux Mixture. Four pounds of copper sulphate, four of lime, and use the arsenite. I will speak of that in my paper this afternoon, and will say that in spraying fruit trees you can vary it a great deal.

A Member: Do you use guano in fertilizing?

Professor Green: No, I have not. It has been quite high and hard to get, although you can get it now. I did use it some years ago, but I don't remember the results, but from my own experience I would use at least five hundred pounds of acid phosphate, and I would not care to use anything else, if I had reasonably good ground to begin with.

Professor Taft: Will you kindly tell us what kind of soil you have?

Professor Green: It is clay loam, with considerable sand, but not enough to make it what you would call sandy soil. We have tried a very heavy soil, and sandy soil, and light sandy, and in every case the

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result has been the same in Ohio, yet there have been experiments made in other States that would show that potash was more useful than phosphoric acid.

Professor Taft: Did you report the effect of spraying with your mixture this year?

Professor Green: No. Probably it was not nearly so effective this year as last.

A Member: Have you found that barn yard manure was conducive to scab and blight?

Professor Green: Of course when it is fresh, but I have never been very much afraid of it.

A Member: Will it cause blight?

Professor Green: Not that I know of, not that I am aware of.

A Member: What about commercial fertilizer?

Professor Green: We carry on a test on about four acres each year, and we expect to get from two to three hundred bushels per acre.

A Member: How many pounds of acid per acre do you use?

Professor Green: We vary that a great deal. I would say about five hundred. You can not use very many applications.

Mr. Kingsbury: About how much does it cost per ton?

President Stevens: Acid phosphate is about fourteen dollars.

Rev. Smith: How do you apply acid phosphate?

Professor Green: Scatter it in the furrow along the sides.

Rev. Smith: At the time of planting?

Professor Green: Yes, sir.

Rev. Smith: On the seed?

Professor Green: Before we drop the seed.

President Stevens: I usually plant it right in with the seed.

A Member: Was it a late variety you planted after strawberries?

Professor Green: Yes, it was a late variety, but I don't care whether it is an early or a late variety, and if you will sprout the potato they

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will come up and be ready to cultivate in a week's time or ten days anyway, from the time they are planted. When the potatoes are planted in that way only the two sprouts will grow, and of course the others remain dormant.

President Stevens: In that way you will have to plant by hand, won't you?

Professor Green: We do, although the sprouts are very strong, and will not break easily.

A Member: Do you plow the strawberries under just like you would sod?

Professor Green: No, I use the disk harrow first.

A Member: What is the difference in results as between bone phosphates and acid phosphates ?

Professor Green: Not very much in results.

President Stevens: Would it pay to use bone on potatoes?

Professor Green: Some bone will do very well.

Mr. Reed: I would like to ask Professor Green if he has used second crop seed very much and what is the difference that he has found

Professor Green: I have and found it all right.

Mr. Reed: Wouldn't you prefer it to other seed, as a rule?

Professor Green: Yes.

Mr. Reed: I invariably grow a better crop.

Professor Green: A great deal of the so-called second crop seed on the market is not second crop, but I grow my own.

A Member: I would like to know if any of the growers present have sprayed, or would advocte spraying for blight. If so, let us hear of their results.

President Stevens: Professor Green has.

Professor Green: That is what is called the late blight. It is not found all over the country, but in northern Ohio and in Michigan it is very frequent, but it doesn't seem to be in the southern part of the State so much.

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Mr. Walker: We are not growing the potato at all, for it is so hard to control the blight. I want to make a remark also in regard to what the President has said about straw. If we had more straw in our community we might use it, but it is out of the question, for balers buy and use all of it. We can not use it for potatoes.

In regard to planting with a planter. If a man should drive into my field with a planter and offer to plant my potatoes with it, or by hand, as I preferred, I should use the planter by all means. We plant potatoes about four or five inches deep, and we use a disc-shaped coverer which makes a ridge over the hill, and after they have been planted, and before they have had time to get to the top of it, we drag it down, and that destroys the first crop of weeds, and then the potato will be up in a few days, and that puts them ahead of all of the weeds.

Also in regard to corrosive sublimate. We have used that, but we found it very difficult to use for it is so hard on the hands. It is dangerous in this way, even in its weak, diluted form.

Rev. Smith: I would like to ask how you manage with the straw at digging time. Isn't it a great nuisance?

President Stevens: If you use the straw you can not use a digger, but will have to use forks. When you take the straw off you will find that half of the potatoes can be gathered up without digging them. The soil is perfectly loose, and you can stick a fork into it and turn out all the potatoes. There are scarcely any of them entirely under the soil, and I will say that on an average half of them are on the top of the ground between the straw and the soil, and a man can dig them easily with a fork.

Mr. Osborne: I should like to ask if Mr. Snodgrass plants potatoes on the same ground in succession.

Mr. Snodgrass: I would like to have a new field for potatoes every year. I like to have a rotation of crops, for I do not think it is good policy to plant two crops on a field in succession; I mean one crop two or more seasons. I like a change. As soon as we dig the potatoes we sow rye or clover. We have nice rye, or the nicest clover imaginable, so we have potatoes, rye and clover, and that makes an excellent rotation. Our main crop of potatoes are planted early; we plant some potatoes late, but they do not do as well as the early ones, as they rot considerably. That was the worst feature we had this year—they rotted very badly, but the early ones did not. We get better results from potatoes planted early.

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A Member: Some years we do not notice blight on the potatoes at all, but they are struck with it some seasons. I would like to know if we have it one year, will we be subject to it all the time?

Professor Taft: I would say that it depends on the season, and the soil to some extent. In the eastern States, they have had blight every year for thirty or forty years. In Michigan it is a new disease. We had no great trouble with it until the last two or three years. If we do not spray we lose a large part of our crop. It depends on the time of planting and as to how they are treated. As a rule, the first of June the potatoes are planted, then you would not have to spray before the middle of July, or probably the first of August, but they should be sprayed before the disease shows to any great extent, and then again according to the season, perhaps in ten days, or once in two weeks will answer in some seasons, and then again within ten days of digging time. About four or five applications as a rule will suffice.

A Member: Do you treat every year, whether you have the blight or not?

Professor Taft: As long as the blight shows. If we get along without the blight we would not have to spray so many times. I would spray about the first of July for bugs, and then again about the middle of July or the first of August for blight, according to the season. If you will spray before they blossom as a rule it is early enough for late blight, and then again in about ten days or two weeks, or oftener if it rains and washes it off.

President Stevens: Would you wait until the blight appears?

Professor Taft: To have the best results you ought to spray before the blight shows.

Mr. Davis: We have found formalin and corrosive sublimate more or less dangerous, and I have read an article that bisulphide of carbon is as good as anything, and a quantity can be treated at a time in a close bin. Have you tried that, Professor Green?

Professor Green: No.

Professor Taft: We have not used the bisulphide of carbon.

Mr. Davis: Do you know whether it will do the work or not?

Professor Taft: I am not sure it will.

Mr. Davis: It is recommended by different growers. If we could use bisulphide of carbon in a closed bin it would be much less trouble, and I should like to know about it.

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Mr. Henby: I straw my potatoes, and I get a double benefit out of the straw because I save the expense of a commercial fertilizer. We run our straw as bedding through our barn stables, and then put on the patch, and we think it makes a much better mulch than the clean straw, and it holds moisture just as well.

Mr. Swaim: I should like to ask what would be the maximum value of straw where you could afford to use it for mulching potatoes?

President Stevens: I think where you can sell straw for a dollar and a half a ton you can make more out of it to use it as a mulch for potatoes. I do not believe it would pay to mulch potatoes on black soil, for it retains the moisture better than clay. I would not advocate the use of straw on every kind of soil. I am speaking of limestone, clay soil, with a very little sand in it, a soil which means a complete failure otherwise in dry seasons.

Mr. Kingsbury: Is it in a rolling section?

President Stevens: Yes, sir. Our straw brings about $1.50 per ton, and I figure that I can make more than that by using it for the potatoes.

Mr. Davis: Will it rot in time?

President Stevens: Yes, sir; I always turn it under after digging the potatoes.

Mr. Swaim: We find it very hard with us to get straw for any use, for it is worth on the market from six to eight dollars a ton.

Rev. Smith: How many tons will it take to the acre?

President Stevens: I am not able to say. I think it will take about ten wagonloads of straw to mulch an acre. In one day two hands will mulch an acre.

Mr. Davis: Then there is a twofold benefit, for you are getting manure on the ground.

President Stevens: I find that it is a good way to get humus into the soil. The soil will not need a commercial fertilizer for three or four years after to produce maximum crops.

We might now hear the reports from the members of the Committee on Horticulture. The first district.

Mr. Ritterskamp is not here, so we will hear from Mr. Reed.

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REPORT FOR SECOND DISTRICT.

BY W. C. REED, VINCENNES, INDIANA.

Mr. Reed: Mr. President, Ladies and Gentlemen—

The year 1905 has been what most fruit growers call an off year. Strawberries gave a large yield, but prices were rather low, in fact below the average. One reason for some of the low prices was that Decoration Day came on Tuesday, following our heaviest Monday's picking, so that the berries we had went on a poor market, there being no one buying for canning purposes on a legal holiday.

Another reason being heavy rains, making berries a little soft for distant shipments. However, the crop yielded a fair profit, but owing to continued wet weather during the latter part of the season there had been many plantations injured by an excessive growth of weeds and grass.

Raspberries and blackberries gave a very light crop, but prices were unusually high, so that net returns to the growers were very satisfactory.

Cherries bore about half a crop, of good quality and fair prices. Plums were almost a failure. This was especially so with the Damson. Peaches about a fourth of a crop, with fair prices and fair quality of fruit. Pears, especially Keiffer, yielded very heavy crops; that is, on some orchards. The prices were somewhat below normal.

The Shepard orchard, situated near Vincennes, planted nine years ago, containing 3,500 trees, one-fourth Garber and three-fourths Keiffer, yielded 10,000 bushels. This orchard bore 600 bushels the third year from time of planting and has not missed a crop since, having given a steady increase in yield each season.

The apple crop generally has been very light. However, the grower that has given his orchard proper care, with thorough spraying and thorough cultivation, has been rewarded with a fair crop, fine fruit and extra fancy prices, showing that it pays to spray thoroughly and give your trees the best of care.

I might mention a few of the best crops in this district.

The Burton Orchard Company, of Orleans, Ind., gathered from 110 Grimes Golden trees 1,500 bushels of apples that sold at $1,500, or $1.00 per bushel. There is another orchard at Vincennes of between 1,100 and 1,200 trees that the crop brought the grower $2,500.

James Wall, of Decker, Indiana, sold a crop from a 25-acre orchard

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for $1,800, and the buyer to pick and pack same. This was sold quite low, however, as the yield was 1,400 barrels.

The writer also had a small orchard of two acres, and after having all the summer apples we wanted for home use and $10 worth for market, sold the winter apples on the trees for $300, the buyer picking and packing same. The total yield was 150 barrels of winter fruit.

The quality was unusually good, this being especially so with the Grimes Golden. I think what we need most to do is to impress upon the grower the fact that if they grow good apples they are compelled to spray thoroughly, as it is impossible to grow apples without it with any degree of success.

Trees have made a very good growth. I do not know that there has been any material increase in acreage; in fact, I think the planting is somewhat lighter than usual.

Mr. Swaim: While these reports are very interesting, there are thirteen districts in the State, and if we undertake to go through with all of them it will take a great deal of our time, and I feel that we might as well have these reports handed to the Secretary and filed with him and have them published in our report, and not have them read at this time, and I will move that these reports be handed over to the Secretary to be printed in the report.

Mr. Zion: I second the motion.

(Voted on and carried.)

President Stevens: We are now ready for miscellaneous work.

Secretary Flick: I would like to bring this before the society. Two of our worthy members—D. H. Goble, of Greenfield; Snead Thomas, of Marion—have since our last annual gathering deceased, and it seems fitting and proper that this society at this meeting should take some action in the matter.

Mr. Kingsbury: I would move you that a committee of three be appointed to do this, and report to this meeting later.

Mr. Zion: I second the motion

President Stevens: This will be referred to the following as a memorial committee to report later:

Mr. Kingsbury, Mr. Shoemaker and Mr. Hale.

We will now hear from Mr. Kingsbury on a matter which he wishes to present.

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Mr. Kingsbury: I want to present a few facts in regard to some experimental work that is being carried forward on the State Fair grounds, and to urge this society to establish and maintain an horticultural experiment station in connection.

Mr. Tillson: We have with us here a member of the State Board, and a member of the Executive Committee, who has as much to say and know about that as any one, and I would like to hear from him as to whether or not he thinks there is any place on the ground that is not being used--Mr. Sid Conger.

Sid Conger: Mr. Tillson is a member of the Board and has as much to say as I have. This matter was up a few days ago before our Board incidentally, and members who were present said they would give all the ground that was needed, and if you want more you could have it. About two weeks ago there was a meeting here of the Marion County Horticultural Society, and I suggested to these people that Purdue University was to get an addition of twenty-five thousand dollars a year from this State over what they already have of fifteen thousand from the Government, making forty thousand dollars, and there is no reason in the world why they should not help this undertaking and help pay the expenses of carrying on the experiments at the fair grounds. It seems to me that if this was suggested to them they would act right about it, but they had absolutely refused to put a sub-station at the fair grounds, but Mr. Kingsbury took up the work and made a very good showing. He let the weeds and the alfalfa grow and fall down, and he couldn't get a good stand, for you must clip it or cut it.

I don't believe there would be any objections from a single member of the Board to giving you all the space you want out there. While we farm it, it doesn't make us any money. I do think you ought to have some help from Purdue University toward paying the expenses. I have been told that they have about eighty experiment stations outside of their station at Lafayette, or, in other words, there are eighty in the State, and why not put one here in the center, where all of us can get at it and a larger number of people see it. I think all you will have to do will be to make application for the ground and you can get all you want, but I insist that you ask Purdue University for help to pay the expenses of planting and taking care of it.

Mr. Kingsbury: Wasn't the plat well kept?

Sid Conger: It was all right, but it is too expensive to do these things with a hoe.

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Mr. Kingsbury: The President suggests that we postpone the further discussion of this matter until the evening session, when Professor Hollister will be here.

President Stevens: I have here two trees which were planted at the same time. (Figures 1 and 2.) No. 1 was planted with the whole root, and the other by the Stringfellow method. You can see for yourselves what a difference there is in the growth. The one planted by the Stringfellow method has made a good deal more growth than the other, and it is much more symmetrical. If I were planting another orchard I am sure I should use the Stringfellow method. By this method you cut the roots to within about a quarter of an inch of the tree, stick it into a hole in the ground, made with a crowbar, put dirt around it and pour in water, and add sand until the hole is filled up solid around the trees, and stamp it down.

Mr. Kingsbury: What variety is that tree?

President Stevens: A Ben Davis.

Mr. Kingsbury: Did they all make as much root as that?

President Stevens: That is the first one I ever dug up. These are the average trees. I planted about twenty at the same time and some show much more difference in growth, and there is not a single one of the Stringfellow plantings but what made more growth than the ones with the whole roots. I brought these two because they were fair samples and fair representatives, but some showed much more difference in the growth than is shown here.

Mr. Zion: You say you left the roots about a half inch long?

President Stevens: No, I did not leave them over a quarter of an inch. If you cut it off close you get too much bark, therefore I left the root a quarter long.

Rev. Smith: If you should transplant that again, would you cut the roots off?

President Stevens: I do not know. I will give these trees to someone who will continue the experiment.

Rev. Smith: And your treatment of these trees was the same after you had set them out?

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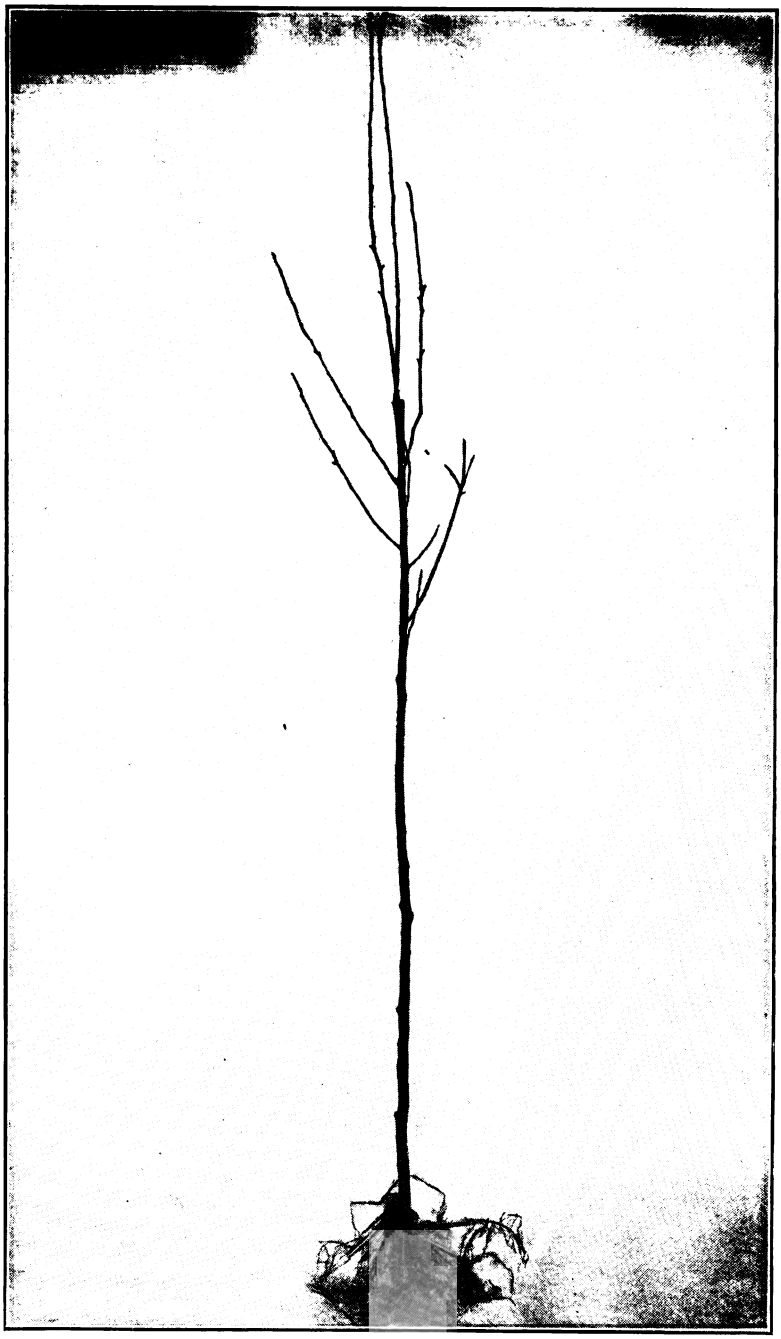

FIGURE No. 1.

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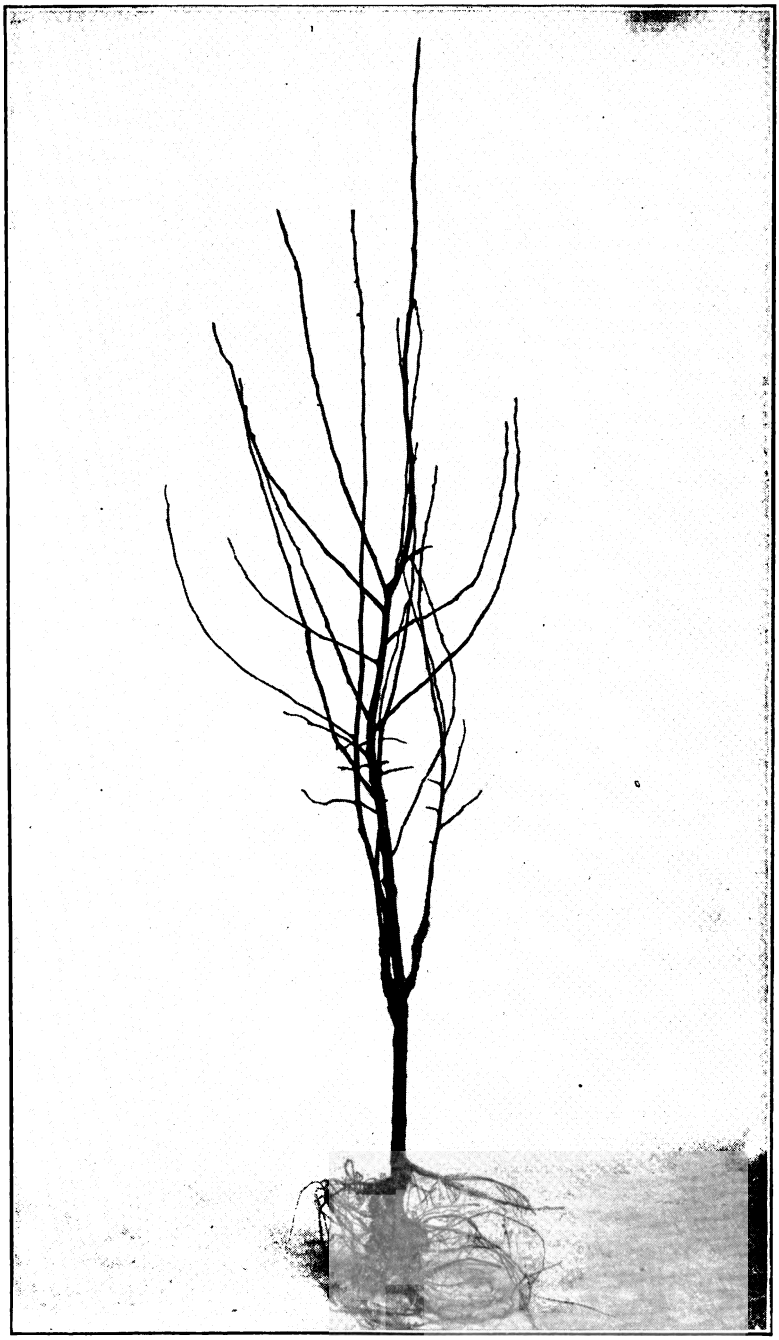

FIGURE No. 2.

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President Stevens: Yes, they were simply mulched.

A Member: In a broken-up and cultivated soil?

President Stevens: They were placed in an orchard grass sod and mulched with common wheat straw for a distance of about three feet.

A Member: I would like to inquire if they were planted this last spring.

President Stevens: A year ago last spring.

A Member: Did you have as much moisture as you have had this year?

President Stevens: Yes, sir, and it was the most surprising thing to find that this tree planted by the Stringfellow method threw out growths about five or six days earlier than the other, and didn't have any roots at all when planted.

Mr. Zion: Did you prune the roots of the other one?

President Stevens: No, sir.

Mr. Zion: Well, that accounts for it, then, for if they had been properly pruned there would not be so much difference.

President Stevens: I think the average tree is planted just as it comes from the nursery. Isn't that true, Mr. Hobbs?

Mr. Hobbs: I think so.

Mr. Zion: It should not be, and if those trees had been pruned properly there would not have been so much difference. I have tried the Stringfellow method and I don't want to try it again.

President Stevens: I planted them just as I thought the majority of people would plant them. For my part I am very much in favor of the Stringfellow method. The trees are here for your examination if you would care to examine them.

If there is nothing further to come up at this time we will stand adjourned until 7:30 this evening. Please be prompt.

(Meeting stood adjourned until 7:30.)

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WEDNESDAY EVENING SESSION.

President Stevens: The meeting will now please come to order. At the close of this afternoon's session we were discussing the subject of the operation of an experimental station in the State Fair grounds, and Mr. Kingsbury wants to bring the matter up again, either by himself or deputy.

Mr. Kingsbury: No. I want Mr. Flick to have a word on the subject, and then I want to hear from Professor Hollister. I think all of you would like to hear Mr. Flick say a word or two in regard to the matter.

Secretary Flick: I have not thought specially on this subject at all for some time, but it occurred to me, as it has to others, that a great many people, especially the progressive people of our State, at least, once a year come to Indianapolis to the State Fair, and they do not come merely as a holiday, but they come to learn something which would be useful to them when they go home. They learn quite a good many things at the State Fair; but the most vital information is lacking. They only see the results there. That, really, my friends, is the only thing they can see—just what you have produced on your farms—but they would like to see how you do it. You know that this is the key to success. It is a very important part, for unless we know how things are done we can not do them; unfortunately this can not be brought out in all of the exhibits which are at our fairs. Anything that will help us to do our work better when we return to our homes will be of great benefit to us, and it occurred to us that on these State Fair grounds, without a great deal of expense, there could be maintained a model orchard and plantation of small fruit, and there can be shown that which has received proper treatment and that which has not, and which has been neglected, and many other ideas. The matter of accessibility and the great number of people who can visit our capital city at little expense, which is not possible at Purdue University Grounds and Experiment Station, should be a strong point in its favor, and I can not think of any other place that would be more appropriate than our State Fair grounds for this purpose. If the enterprise is successful it can be added to as means can be supplied from time to time, until all can see what the result would be to the State of Indiana. And I believe that this society should take some steps in furthering this enterprise. It certainly can be made with but very little expense, as the material for putting out this plantation could be

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cheaply obtained. We have enterprising nurserymen and fruit growers throughout our country who would be very glad to contribute of their stock to this purpose. They could be taken care of cheaply from the fact that part of the grounds which already belong to the State Fair Association are cultivated, and so cultivation of the ground would not be very heavy and expensive. As has been recommended today, we need not cultivate it altogether with a hoe, but could use machinery. I believe that it would be a good thing for our society to urge the establishment of this experimental station at the State Fair grounds.

Mr. Zion: About what would be the estimated cost?

Mr. Kingsbury: I can only say that it has cost us about seventy-five dollars this summer, and half of that expense was borne by the Winona Agricultural Institute, and the Indiana Farmer Company the rest, and I think it need not cost over a hundred and fifty dollars to cultivate an acre and a half. We had about an acre. It would depend, of course, on the way we managed it. It can be made more or less expensive in accordance with the plans we pursue. We would have to decide on that.

May we hear from Professor Hollister for ten minutes or so?

Mr. Hollister: Mr. President and Friends—Mr. Kingsbury has explained this afternoon what we have been carrying on at the fair grounds, so that it will not be necessary for me to go over that ground again.

I suppose about fifteen years ago the Department of Agriculture commenced to formulate plans whereby they might gather together knowledge that might be handed down to the people, to increase the productiveness of the soil. They expected that there would be sufficient interest in the State to accept as the opportunities were offered, and also by educational institutions. Being interested in an institution of that kind we were not slow to take advantage of the opportunity that was offered us by the Indiana Farmer Company to do some practical work. We do not wish to do the work that the experiment stations are engaged in, but rather do work that any farmer or fruit grower can do, and furnish an object lesson. We feel that we get more in our school work, twenty times more out of the object lessons than we get out of the class-room work, although they go hand in hand. Our boys last year marketed about eight hundred dollars' worth of products off of about forty acres of land. Of course, that was largely market gardening products, and we have the park to supply, which furnishes a good market. They keep the books and handle the money. So

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you see we are infatuated with object lessons, and we want to extend them as far as we can, and we took advantage of this opportunity, regarding it as one of the best, and I think that horticulturists ought to take advantage of this and help to furnish an object lesson. A great many people come to the State Fair and they will be interested in what they see. They have already been. Next year we hope to be able to furnish more and better object lessons than we have this year. There can be no question as to the value to be derived from object lessons. I have myself in the early part of my experience paid from fifty to seventy-five and a hundred dollars to get an object lesson along the line of experience, but that is rather expensive. This need not be. This is a central point, and the Board of Agriculture will give us the use of it. We can do a great deal of good in this way. We can not tell the extent of the impression it may cause on the minds of people, and it may be the means of adding tens of thousands of dollars to this State, and it seems to me that it is high time we take up all of these projects as far as we can extend the work. It is our duty to do these things, and help educate the masses. We must increase the productiveness of our soil, and encourage people to live by the soil so as to increase its productiveness. We have five or six million farmers, and if we can increase their productive capacity from the soil to one dollar each it can easily be seen what would be added to our prosperity. We have noticed that England and France and Germany have steadily increased their average yield, especially in the northern part of France, where they have increased it from seventeen to twenty-five bushels to the acre. We have not done that. The time is coming when we will have to. We need to build up the horticultural interests of this State, and the horticultural industries. Only the other night I went to a city near which I live to buy some apples for Thanksgiving, and had to pay sixty cents a peck, and then didn't get very good apples. Two weeks ago I saw apples selling in New York City for four dollars a bushel. Our western brothers are getting four dollars. It seems to me that Indiana could make something at twenty-five cents a peck, and we ought to encourage it, and we will be glad to offer any assistance or work in conjunction with you in any way to forward this work, and I hope you will seriously consider it.

Mr. Tillson: I should just like to say that the Board will be very liberal with us. We have not asked for any increase in the horticultural department that we didn't get, and the expense of this would be very light. We own two good teams and have plenty of implements, and there is plenty of good ground on the outside of the fence, as Conger said.

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There is fine ground there, and there is no one opposed to our having it, and as a member of the State Board I will make a suggestion that we proceed at once to make some arrangements. We ought to do it right away. The Board will meet on the 2d day of January and that would be the proper time for it.

Mr. Kingsbury: We do not have very much time to close up the matter, and in order to expedite matters I move you that we appoint a committee to consider and investigate this subject, and give that committee power to act in the matter.

Mr. Tillson: I second that motion.

Mr. Hobbs: I would like to amend that motion by referring the matter to the Executive Committee, with power to act.

Mr. Kingsbury: I accept the amendment.

Mr. Zion: It strikes me as a very indefinite proposition. We have a very few dollars to spare for outside experiment stations. Now, I don't know how it is in other counties, but I know that in Tippecanoe County there is scarcely a home but what has trees planted around it, and it strikes me that the duty of this society is to try and make every home an experiment station. I believe, with half the money we require to carry on the station we could do this. I see no use particularly in establishing a station on the outside of the fair grounds. I do not believe there would be a tree left unless there was a man to guard them night and day, and a high fence, too. For one, I seriously object to a proposition of this kind. I believe it is our duty to encourage horticulture in every way and manner that we can. I have done this by planting fifty acres. I am trying to make my home an experiment station. I do not believe our members could be induced to go and look at your trees, because they have them at home. I see where it would be very nice for the nurserymen to work with the Indiana State Fair people, and bring the trees to a state of production. I can easily understand that from the nurseryman's point of view, but I would not take up the proposition out there; but, as I have said, if I were a nurseryman I would, and bring the trees into bearing, and I would keep a guard there if it was necessary. I very seriously object, especially since there is nothing of a definite character. We do not know what it would cost. Take a lesson. We do not want any more of that kind of stations in our hands. All of you may vote for it, but I object, and therefore I move you that this motion be laid on the table.

A Member: I second that motion.

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(Voted on and lost.)

(Mr. Kingsbury's motion voted on and carried.)

(Music by orchestra.)

President Stevens: We have with us Professor Taft of the Experimental Station of Michigan, who will now give us a lecture on "Potato Growing; Some Diseases Affecting." We touched on this subject this afternoon.

Professor Taft: I find that there is no one crop that is more generally cultivated over the country than is the potato crop, and all of you are aware that the returns received by the average grower are quite inadequate. I figure that the average yield for the potato is not far from twenty-five bushels per acre, and as many growers are able to secure from one hundred to two hundred, and even five hundred, bushels to the acre, you can see that many growers must produce less than seventy-five bushels, and while it is possible with only ordinary care to obtain two hundred and more bushels, it shows that every potato grower should be well informed in regard to the best methods of growing potatoes and of controlling the various infectious diseases.

During the past two years in Michigan, and for many years in the eastern States, the yield has been reduced from twenty-five to fifty per cent. by the attack of three or four quite common fungus diseases, and it is a part of my plan to discuss with you this evening the nature of these diseases, the effect upon the crop, and especially the method of controlling them and thus enabling the potato grower to in some cases double the yield secured.

I have brought with me a number of slides that I shall use to show you these things. These slides were furnished by the Department of Agriculture at Washington for the use of institute lecturers, and the slides themselves were prepared under the direction of Prof. S———— of the New York Experimental Station. They have had the potato blight in that State for years, and have been experimenting with remedies for it, and these slides in a large measure show the result of their work and investigation.

We have had no blight to speak of in Michigan for the last two years, but for a number of years I have sprayed for it, and the results I have secured agree very well with these which I shall show you with the slides, which, as I said, came from Washington.

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THE POTATO AND POTATO BLIGHT.

BY PROF. L. R. TAFT, AGRICULTURAL COLLEGE, MICHIGAN.

Of the ordinary farm crops, there are few that show a greater variation in yield than does the common, Irish potato. This may be due to a variety of causes, such as: (1) A soil that is not adapted to the crop, or that is lacking in plant food. (2) Want of proper preparation of the land or the needed cultivation. (3) Climatic conditions that prevent the proper development of the plant or tubers. (4) The attacks of various insects or fungous diseases. Any one or all of the above might result in an almost complete failure of the crop so that it may not be worth digging, while on the other hand, yields exceeding one thousand bushels per acre have been secured when everything favored the growth of the crop. Of course, these are extreme cases, but it is not uncommon to have one man secure fifty bushels per acre and another to harvest a crop of three hundred bushels.

The potato plant is one that reaches maturity in a comparatively short time, and, to secure the best results, the conditions should be favorable. In a general way, it can be said that the soil should neither be very heavy nor very light. A moderately heavy sandy loam or a light clay loam being well adapted to the crop. Some of the muck soils that contain the needed quantities of potash and phosphoric acid also answer well for this crop, provided they are in a suitable physical condition. Care should be taken on the one hand to avoid an excess and on the other to provide suitable quantities of water so that the crop may at no time be checked in its growth. This can ordinarily be secured when the soil is well supplied with humus, and there is no better way to secure it than to place the potato crop after clover in the rotation. If a good clover sod can be turned under, there will be little difficulty in securing a large crop of potatoes if other conditions are favorable.

The planting and care of this crop has already been thoroughly discussed by other speakers but I wish to advocate the use of a smoothing harrow within a week from the time the crop was planted, or as soon as the ground is dry enough to work, if a heavy rain comes within that time. If the potatoes were planted at the proper depth, they will not be disturbed and it will not only make it easier for the tender shoots to make their way to the surface but the working of the land in this way will destroy the small weeds and grass so thoroughly that the after cultivation will be greatly reduced and the field will be much freer from weeds than it would otherwise be possible without hand hoeing, which is always an

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expensive operation. Especially if the soil is of a heavy nature, the land should be worked as soon as the plants mark the rows, using a cultivator that will work to the depth of three or four inches. As the roots develop, the depth to which the ground should be worked should be lessened and after the plants are half grown, shallow culture only should be given. For this purpose, a twelve-tooth cultivator answers very well, and, for light soils, something in the nature of a weeder might be used.

Ordinarily, level culture will be found desirable, particularly in a dry season, as the evaporation will be less than when the potatoes are ridged. It is often claimed that the hilling up of potatoes is necessary in order to keep them below the surface and thus avoid the sun-burning of the tubers. There will be no great danger of this with level culture, provided the land has not become puddled and baked, thus preventing the potatoes from developing below the surface. In a wet season and particularly upon a stiff soil a slight hilling of the potatoes will not be objectionable. If the soil contains a fair amount of humus and a frequent shallow cultivation is given the crop, it will be possible to mature a large crop of potatoes, but if they are checked in their growth by a lack of moisture, serious results may follow. The effect may be equally injurious when there is an excess of moisture in the soil or if the weather is warm and muggy at the time the tubers develop.

Anything that tends to check the perfect development of plants seems to render them more subject to the attack of insects and diseases, and when a crop of potatoes is growing under favorable conditions, it will be more likely to escape injury from potato beetles and other insects and the varius fungous diseases than when it is suffering from an unfavorable environment.

Late Blight.—Especially in the eastern states, great harm has been caused by a fungous disease that is commonly spoken of as "potato blight." This not only destroys the tops but frequently results in the rotting of the tubers, so that the entire crop may be lost. It seldom does much to early varieties that are planted in April but is especially injurious to late-planted early varieties that ripen in August. This disease is of a fungous nature and can only develop where the spores are present. It is commonly attributed, however, to unfavorable climatic conditions. It is true that the disease seldom appears, or at most does little harm except when the temperature averages about seventy degrees and when there is a surplus of moisture both in the soil and atmosphere. It so happens that during the months of August and September, we frequently have spells of warm muggy weather when the conditions are very favorable for the development of the spores of this disease. If they fall upon the leaves of potatoes they will germinate and enter the tissues. A slight browning will

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be noticed and the leaves will soon begin to dry up. If the air is moist, the spores will develop on the under side of the leaves upon the ends of the slender stalks. These are produced in great numbers and spread the disease to other leaves or may be washed into the soil down to the tubers by rain, and result in the rotting of the crop. It is often recommended to dig the potatoes as soon as they are ripe in order to prevent serious losses, but if this is done, care should be taken to see that they are stored in a suitable place, as, if kept where it is warm and moist, the work of the rot will continue. If they can be spread in thin layers in a cool, dry place, the rot may be prevented; but if in deep piles, the heating and sweating will bring about the very conditions that are most favorable to the development of the rot.

When the blight has become prevalent in a neighborhood, it is hardly probable that any field will escape entirely although the character of the soil and season will have much to do with the extent of the injury. It will be well to take all possible steps to prevent the attack of this disease. Much can be done by selecting a soil that is naturally quick to drain off after a rain and where there is a free circulation of air. A sandy loam is much better for this crop, so far as the blight is concerned, than a clay soil, and low level land should be avoided. A tract upon which potatoes were grown the previous year and suffered seriously from blight should not be used. Much can also be done in lessening the injury from blight by care in the selection of seed. It often happens that, although tubers show no sign of the rot externally, when they are cut there is a discolored ring about a quarter of an inch beneath the skin. This is generally an indication of the presence of the fungus, and such tubers should be rejected.

It is often asserted that early varieties are not attacked by this disease. This is true when early varieties are, as is usually the case, planted early enough so that they ripen before the first of August, but when the weather is favorable for the attack of blight earlier in the season or when early kinds are not planted until late in the spring, they are often more seriously injured than the late varieties.

Although there are no varieties that are actually blight proof, considerable difference can be observed in the susceptibility of different sorts and even in the extent to which different plants of the same variety are attacked. It is possible that by careful selection of seed from some of the varieties that are least injured or even better by the growing of seedlings from these varieties, in a few years we can obtain kinds that are able to a large extent, at least, to withstand the attack of this disease. At the present time, however, we must recommend the use of varieties that seem best adapted to one's section and which have qualities that make them desirable for market. This will be possible, as it has been ascertained by

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carefully conducted experiments which have been supplemented during a number of years by actual tests in the field that this disease can be held in check so that, under ordinary favorable conditions, the injury either to the tops or to the tubers will be comparatively small.

The treatment should be preventive rather than curative and should begin before the disease appears. The proper time for spraying can be determined to a considerable extent from the weather conditions as, if there are two or three days of moderately warm and moist weather during the early part of August, it will be likely to produce blight. A thorough spraying with Bordeaux mixture should be given at that time, especially if the disease was prevalent in the locality last year. The number of applications required to control the disease will be determined in much the same way as well as the periods that should elapse between the treatments. If the weather is warm and wet, the potatoes should be sprayed once in ten days, or even more frequently in case the Bordeaux mixture is washed off by drenching showers.

In some seasons the weather during the month of July is favorable for the development of blight, and if it appears upon early varieties they should be sprayed at once. In ordinary seasons two or three applications will be sufficient, but if the conditions are favorable for blight, and particularly if it is troublesome upon unsprayed fields, five or even six applications can often be made with profit. On the other hand, if the weather remains dry during the months of August and September, there need be little fear from blight, but one spraying about the first of August and later if the bugs are troublesome should be made.

Bordeaux mixture is by everyone regarded as the best remedy for this disease. The usual formula is 4 pounds copper sulphate and 6 pounds of stone lime in 50 gallons of water. It will generally be convenient to prepare stock solutions of the copper sulphate and lime. Twenty-five to 50 pounds of copper sulphate can be readily dissolved by suspending it in a coarse sack free from lint in an equal number of gallons of water. It will generally dissolve without attention within twelve hours. A half barrel or more of lime may be slaked in a box or barrel, taking care not to use so much water as to "drown" it or so little as to allow it to burn. If a smaller quantity is to be slaked, it will be well to use hot water. Prepared in this way, it will be a simple matter to take out as many gallons of the copper sulphate as will be required to make a tank or barrel of Bordeaux mixture. If the amount of water used in slaking the lime is only sufficient to leave it in a thick paste, the proper proportion of this can be readily determined. In forming the Bordeaux mixture, it will always be well to dilute the copper sulphate solution and the lime before mixing it. Thus if 4 gallons of the solution is added to 21 gallons of

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water and 25 gallons of water are added to 6 pounds of lime and the two are then poured together and the mixture is at the same time stirred, it will remain in suspension much longer and will be found a much more effectual remedy than when the copper sulphate solution and lime are mixed before they are diluted.

The apparatus necessary for applying Bordeaux mixture to potato fields will depend upon the area to be treated. In small gardens one of the portable, compressed-air sprayers holding four or five gallons can be used, but for more extensive areas a barrel pump will be necessary, and, for fields of ten acres or more, some of the power outfits will be desirable. If the area is not too large very good results can be secured with a barrel pump either in a kerosene barrel or a tank holding 100 gallons, mounted upon a two-wheel cart. One man can both drive and pump and a very inexpensive arrangement of gas-pipes will apply the material with little attention. While the plants are small, there should be a single nozzle over each row, but later on, a double nozzle will be desirable. The spraying rod can be connected with the pump by means of a short piece of hose, and by the use of a lever the spraying rod can be shifted so that the nozzles will be kept directly over the rows. If a power outfit is used, it is desirable to have one that will carry a pressure of from sixty to eighty pounds, in order to secure a mist-like spray. When one horse is used, four rows can be treated at one time; but if a team is employed, five rows can be covered.

The cost of the application will depend somewhat upon the size of the plants and the efficiency of the spraying outfit. Ordinarily it will range from 75 cents to $1.00 per acre, and, as from three to six applications will generally suffice, the cost of spraying a field of potatoes for the prevention of late blight will range from $3.00 to $5.00. Just how profitable the venture will be depends, of course, upon the amount of injury done by blight and rot, as well as upon the price that can be secured for the potatoes. It is not uncommon to have a crop that has not been sprayed entirely destroyed, while a loss of from 20 to 100 bushels per acre is often caused by the late blight and the accompanying rot. From this, it can be seen that at the price of 20 cents per bushel a gain of twenty bushels per acre as a result of the spraying will repay the cost, while if the crop can be increased one hundred bushels as a result of the spraying, it will show a very large profit.

Early Blight.—Although the disease known as the "true blight" of the potato has not been known for many years in the States of the Central West, a form that has been spoken of as "blight" has long been known and has done considerable harm. From the fact that it is generally most troublesome during the months of June and July and to the early varieties

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the name of "early blight" has been given it. This also is a fungous disease, but its nature is quite different from the late blight. It is especially troublesome when the growth of the plants has been checked by hot, dry weather and when they are suffering from a lack of plant food. Any injury to the leaves by flea-beetles, or the burning of the leaves due to the improper use of Paris green, seems to increase the injury from this disease as they afford entrance to the germs. The disease appears as a browning of the leaves in spots that show concentric markings, and as they enlarge they will, if numerous, run together and thus involve large areas of the leaves. In some cases the entire plants may be destroyed. This disease does not affect the tubers, but when the tops are destroyed their growth will be stopped, and if the disease comes before their development has been completed the tubers will be small in size and of course the yield will be slight. This disease frequently shows itself in June or early July, when the potato beetles and other insects that eat the leaves are most likely to be at work. Particularly if the growth has been checked in any way it will be well to spray the vines, as this will have a good effect in checking the work of the insects as well as in preventing an attack of the early blight. Although the late blight does not appear until some weeks later than this, the treating of the vines in the early part of July for the early blight would have some effect in keeping off the late blight. Even though the insects do not appear to be doing much harm it will be well when spraying for the blight to add eight ounces of Paris green to each barrel of Bordeaux mixture, as the expense will be but slight and there are few fields in which there will not be some insects at work.

While the spraying of potatoes for blight may not be necessary in all seasons, the disease has appeared in most of the Eastern and Central States and when the conditions are favorable for its development it will be a good insurance to have the spraying outfit ready and give the vines a thorough treatment.

The average potato crop is but little more than one-third the average crop of our best growers, and when it is possible to increase the crop three-fold or more by a little more attention to the selection of the soil and its proper preparation and tillage, the more careful selection of seed and controlling injurious insects, it is certainly a safe business proposition.

President Stevens: Why doesn't the potato bug bother the potatoes that are strawed?

Professor Taft: I think in most cases they are growing vigorously, and they have plenty of moisture. That is all the reason I can assign. They are growing perfectly, and they are free from the attack.

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(Music by orchestra.)

(Recitation by Master Swaim, of Zionsville, Indiana, entitled "Mary Ann." Encored and he spoke one of his own composition about the members of the Indiana State Horticultural Society.)

President Stevens: After we have heard a few announcements we will adjourn. You understand that there is to be a social and reception for you immediately following the adjournment, in which you will get to test some of our Indiana apples. Let everyone be on the reception committee, and get acquainted with everyone else.

(Meeting stood adjourned.)

THURSDAY MORNING SESSION.

President Stevens: I would suggest this morning that all of us try to expedite matters as much as possible in the way of business. We have a big day's work before us, and we want to avoid all unnecessary discussion as much as possible, and do as much business as we can.

We will now call for the reports of the committees. If there are any ready to report we should like to hear from them at once.

Mr. Hobbs: If this is the place for the report of the Legislative Committee I might take a moment and report. This committee was appointed a year ago at a meeting of this society for the purpose of looking after legislative matters, and especially getting an increased appropriation, and met together in the city of Indianapolis and agreed what action they would take, and that was to confer with the individual members of the Legislature as soon as possible. Secy. Flick prepared a circular letter, setting out what we are doing and what we propose to do and our needs, which was mailed to each member of the Legislature before the opening of that body. Later, we proceeded to arrange for a meeting with the Ways and Means Committee and the Committee on Finance of the Senate. We arranged with the chairman to have a joint meeting one evening, and when the committee came to gether we had a display of Indiana apples contributed by Joe A. Burton, Mr. James Zion, Mr. Flick and others. It was a very large table at which the com-

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mittee met and transacted its business, and that table was very fully loaded with very tempting Indiana apples and some Kentucky crabapple cider for washing the apples down. With the apples and the cider we were able to make a very favorable impression. In fact, one of the members suggested as soon as he sat down that the appropriation be allowed. And I believe it was a pretty good way to lobby. We were charged in the papers with openly bribing the Legislature, but I think probably that statement was not very seriously taken by anyone. The purpose of this display of apples was to show what Indiana can do in the way of producing good fruit, and all we needed was to educate the people to realize their opportunities and show them "how," and we will get good results. That was what we hoped to accomplish with this exhibit, and we did it. We got what we asked for—twenty-six hundred dollars—the largest appropriation the society has ever received from the State, and we think by the proper use of the appropriation we can develop the horticultural interests of the State in a large way so that the people can see and feel the effect, and if this be true there will be no difficulty in getting needed appropriations in the future.

President Stevens: Do you think we ought to have a committee appointed at this session to take up the matter suggested yesterday?

Mr. Hobbs: I would suggest that the Legislative Committee be appointed to stand for two years, as we will meet again before the Legislature convenes, as it meets in January, but not long enough probably to lay plans, and so I would suggest that the committee be appointed now to extend over a period of two years.

President Stevens: Do you make that as a motion?

Mr. Hobbs: I do.

A Member: I second that motion.

(Voted on and carried.)

The committee is composed of—
C. M. Hobbs, W. B. Flick and John Tilson.

President Stevens: I will ask if the Committee on the Experimental Orchard is ready to make a report?

Mr. Hobbs: My understanding is that the report that is wanted is the report from the Advisory Committee. There is a standing committee that has charge of the Experimental Orchard, and last summer in addition to the Advisory Committee the Executive Committee, embracing

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also the President and Secretary, whom I believe belong to this committee, met at the orchard, and I think that the society wants to hear from them rather than from the Advisory Committee, because the regular committee has reported through Mr. Burton's report of yesterday, and I think probably the society would prefer to hear a report from the Executive Committee.

President Stevens: Are there any other committees ready to report?

Mr. Hobbs: I should like to make a statement in regard to the work there when the proper time comes.

President Stevens: I think now is the proper time.

Mr. Hobbs: As our society knows, the work was undertaken about five or six years ago, and we purchased twenty acres of land in Lawrence County, adjoining Orange, and commenced this work. The main object of the work, at first, was probably to originate new varieties of apples, and if possible to develop varieties better adapted to our State than the varieties which we now have. This was the plan. This has been done by planting seed and top working the seedlings, and by crossing some of our best varieties, and by top working the most promising to bring them quickly into bearing. This was the primary object in establishing the orchard, and of course also with that we wanted to carry on a number of experiments, and test varieties. We have somewhere between one and two hundred varieties for general testing, but of course many will be discarded, for some will prove worthy and many not. We ought to tell of our failures as well as our successes, for therein lies the educational value, so that in connection with the origin of new varieties we are bringing into bearing all of the cultivated varieties of apples which we can get hold of and testing them under these conditions, for the State, instead of having individual people test them. The State is doing it for us. Of course these experiments will not answer for every locality in the State, but it does for that one, and will aid a great many sections in the State in the future.

Along with these other experiments we are experimenting with different systems of cultivation and fertilization; that is, the feeding of the soil, and with root rot. We have heard a great deal lately in connection with the proper selection of scions and buds for propagating. We take our specimens from trees that bear typical specimens, and while these experiments have not been continued long enough to get definite results, as Mr. Burton stated yesterday, it can be stated that scions taken from water sprouts, and from nursery trees, and from bearing trees had bloomed at the same time. That is, they all bloomed the same season.

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As far as heavy fruiting is concerned there seems to be no difference when they are worked on the same stalk in the same way.

Also when a variety shows a particular characteristic in its fruit we are trying to find out if that is local or just inherent in that particular tree which produces this kind of fruit. Scions from this tree and also from trees not showing variations have been top worked side by side on the same tree, so they will be grown under exactly the same conditions, so we hope in time to establish whether this variation occurs on this particular tree itself or is in the soil, or what it is. This and other experiments are in progress, and as a matter of course you can not expect us to get results from an experimental orchard in five or six years in apples. There are very few in bearing yet, and we have not had time to determine the value of our experiments there. I am more or less satisfied myself that the State is getting its money's worth out of the experiments. In southern Indiana there are thousands upon thousands of acres of land especially adapted to fruit growing, and little else. It is not adapted to farming. The land is cheap and should be planted to fruit trees and grass, but the owners are attempting to grow general farm crops, whereby if they would plant the land to fruit trees the State would be enhanced by hundreds of thousands of dollars. The testing of different varieties can be done by different methods, but they pursue the right method there, and I believe this will result in immense good to that section of the State, as well as to other parts of the State.

President Stevens: We are glad to have this from the committee. Are there any other committees ready to report?

If not, the first thing on our program will be "Better Methods of Fruit Culture," by Professor Taft.

BETTER METHODS OF FRUIT CULTURE.

BY PROFESSOR TAFT.

Professor Taft: Mr. President, Ladies and Gentlemen—It perhaps seems somewhat strange to most of you that one who is a comparative stranger to the conditions in Indiana should be asked to come here, and talk to you about better methods in fruit culture. The fact is, I am somewhat ignorant about the methods you now use, but I have been through the State a number of times and have had some little chance

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to inspect methods. I have seen fruit which you have produced, and in fact conditions here are somewhat like those we have in the adjoining State of Michigan.

I wish to talk for a few minutes on what seems to be desirable changes in the methods now being used by the fruit growers of Indiana. Of course I do not mean to imply that in Michigan the fruit growers are doing better work, but I know that you have in every State men who are doing better work, and I know that the results these men are obtaining in Michigan, Indiana and other States are sufficient to warrant better methods throughout the State. I know that it may seem like putting the cart before the horse to talk about results in the first place, but it seems to me that perhaps if I alluded to some of the improvements I have noticed in the results secured by better methods it might serve to give a point to what I say.

I have watched quite carefully the markets for fruits of various kinds, not only in Michigan but other States, and I think you will all agree with me that where one is growing fruit on a commercial basis, the only way to succeed financially—and that is the only way to measure success—is to grow only good fruit, and I might say the best fruit. You are aware that in some of the Western States where they use good methods, and where perhaps conditions are particularly favorable for growing fine fruit, that under their methods of cultivation and conditions to obtain fruit, they get as much for their fruit per bushel as we get per barrel. And while one can by a little time and expense double the price, and quadruple the value of the fruit, it would certainly seem time to get at it. And from our own experience in Michigan during the past year, not only with apples, but pears and other fruits, I have seen one man secure, I will say, fifty cents per bushel for his crop, and his neighbor with the same variety, differing only perhaps in the care given the fruit, secure one dollar and fifty cents per bushel, and even more for fancy fruit. This was noticed in Grand Rapids during the pear season. In fact, the crop was so plentiful that those who had not taken good care of their crop and raised fine fruit did not find that it paid to gather them. There were thousands of trees from which the fruit was not picked. It would not bring enough for the picking, but their neighbors at the same time were getting a dollar and fifty cents for their fruit. In one case the trees in the orchard were growing without cultivation, and this had gone on until thirty cents was the top price for it, and twenty-five cents in many cases. The difference between this man and his neighbor was merely in the care. This same thing holds true with apples, but with us this year we have another condition, and I presume you had about the same thing here. At the

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time our apples were in blossom we had cold rains, which are not at all unusual, for this occurs perhaps one year in five, and maybe oftener. When the fruit is in blossom this weather comes on, and it is favorable for the development of the apple scab, and this forming on the fruit stems causes them to be weakened, and if they do not fall off the fruit is not good. Where spraying was done before the blossom opened the fruit was saved, and I have in mind perhaps hundreds of cases where the fruit growers sprayed their trees, or perhaps part of their trees, before the trees blossomed, and secured a full crop of apples, while their neighbors' orchards were practically without fruit, and in some cases there were thousands of dollars saved at the expense of not more than five per cent. of what the fruit brought.

One need only note the condition of the orchards to satisfy himself that the great majority of fruit growers come far short of furnishing the care that is required to secure the best results. In part, this is because a large majority of fruit growers are really farmers who plant fruit trees to furnish a supply for home use, and then if there is a surplus place it upon the market. These orchards are perhaps pruned and cultivated for a few years, but after that time receive little attention beyond the gathering of the fruit. From this it will be seen that fruit growing is really a side issue with such men, and they take what they can obtain from the orchard, regarding it as so much profit. There are, of course, in every community orchards that receive more or less attention, but the number that are given what has been shown by actual practice to give the most economical returns, is very small.

That the way to obtain the greatest profits in fruit culture is to give the trees better attention can be readily shown. From the neglected orchard we continually hear complaints of crop failures, wormy, scabby, or rotting fruit and serious injury or death to the trees from the attacks of canker-worms or the San Jose scale. On the other hand, where the orchards have proper care the crops are not only much more regular but the fruit is produced in greater quantities and as it is comparatively free from the attack of insects and fungi, it will bring two or three times as much in the market. Trees that are properly cared for generally live to produce numerous crops of fruit, while those handled as is ordinarily the case, often fail to start, and if they are not smothered by grass and weeds a majority of them succumb to the attack of borers and other insects. It is perhaps not too much to say that less than 10 per cent. of the trees planted produce one full crop of fruit. The benefits of proper care can be seen in the renovation of old orchards as well as in those newly set. During the last ten years there have been many instances where orchards that have never yielded a profitable crop have, by the expenditure

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of $25.00 per acre, been brought into bearing and the fruit has been sold at from $300.00 to $500.00 per acre. If this has been done, there is no reason why it can not be done in other orchards where the conditions are equally favorable.

As compared with the usual slipshod methods, to get the best results from an orchard two or three things should have attention. Of course it is supposed that the trees are planted in good soil and have a favorable location. They should be of hardy and productive varieties and to be profitable for market, the fruit should be of at least good size, preferably red in color and the texture and flavor should be at least fair in quality. While no rule that could be given would apply in all cases, it is of the utmost importance that the treatment of the trees should be such as would provide plant food and keep the trees reasonably free from the attack of insects and fungous diseases. For convenience sake, the care of an orchard can be divided into tillage, fertilizing, pruning and spraying.

Tillage.—The term tillage is used to cover such operations as are employed to enable the tree to obtain as much plant food as possible from the soil. In securing this, it can be seen that tillage also relates to conserving and controlling the moisture.

Whether the orchard shall be cultivated or kept in sod will depend largely upon the conditions under which the trees are growing. Sod culture is especially adapted to orchards where the land is rolling so that cultivation will be difficult and the surface soil will be subject to washing in heavy rains. Among the other reasons for keeping orchards in sod are that the trees will be less likely to be injured by the winter, partly because of the protection that will be given the roots, and also from the fact that orchards in sod are less likely to make a late growth than when cultivated. After the trees have reached a bearing age the presence of sod will be likely to check the growth and promote the formation of fruit buds, thus favoring the fruitfulness of the trees.

Although we have spoken of sod culture it must not be understood that we are advocating what might be called "hay orchards." As ordinarily handled these are seldom profitable. When grass is grown in an orchard it should not be removed unless an equal amount of plant food and humus is furnished to replace it. By cutting the grass and allowing it to remain as a mulch, fairly good results will be secured, but ordinarily it should be supplemented by straw or other refuse, or better yet by a liberal amount of straw manure spread about the trees over a circle considerably larger than the width of the branches. Just how thick the covering or how much manure will be desirable will depend upon various conditions. Upon light, poor soil the amount will be much greater than when the land is rich and moist, and large trees that have borne heavily

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will require more than young trees. However, it will be safe to use enough to prevent the growth of grass and to conserve the moisture in the soil. This system of culture gives best results upon fairly rich land and with bearing trees, but if the mulch be sufficiently heavy and enough manure be supplied it will answer well under almost any condition and for all kinds and ages of trees.

The disadvantages of cultivation in an orchard have been referred to as the advantages of the mulched orchards. When given clean culture without the use of cover crops, the amount of humus in an orchard soil will gradually lessen, and this will increase both the washing and the loss of moisture from evaporation. The cultivation of young orchards makes it possible to grow hoed crops between the rows and thus cultivate the trees without additional expense. The ideal way is to grow something that can be harvested without disturbing the soil, and then sow some cover crop such as mammoth clover at the last working. If the soil contains a sufficient amount of nitrogen some such crop as barley or oats could be substituted. This method of handling an orchard can generally be kept up for two or three years, and considerably longer in apple orchards planted at the full distance. When the trees come into bearing they can be handled in the same way except that no crop should be taken off, or if the mulch system is not used, a modification of the two could be followed; that is, the land could be kept in clover for two or three years and then it could be plowed and cultivated. In determining which method should be followed the growth of the trees should be considered.

Feeding the Trees.—When trees have been planted upon a good clover sod, or when the soil is in fairly good condition for the growing of farm crops, there will be little occasion of thinking about fertilizers for several years, or until the land is planted to some unusually exhausting crop, but unless the leading shoots upon young trees make a growth of two feet it indicates that a little plant food can be supplied to advantage. The turning under of clover and other leguminous cover crops will furnish a supply of nitrogen and humus, as well as place at the disposal of the trees a considerable amount of the other elements required by them.

Aside from liberal amounts of stable manure, which can generally be used to advantage in almost any orchard of bearing age, it is often possible to procure unleached wood ashes. If applied at the rate of fifty bushels per acre, they will furnish potash and phosphoric acid and serve to balance the excess of nitrogen in the stable manure. In many sections it has been found profitable to make use of mineral fertilizers either in some of the prepared mixtures or by securing the crude materials and mixing them on the farm. Just what forms will be found best depends to

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some extent upon local conditions. An excellent mixture, however, can be made from 250 pounds of nitrate of soda, 500 pounds of nitrate of potash, and 1,200 pounds of acid phosphate. This can be used at the rate of 200 to 500 pounds per acre according to the age of the trees and the amount of plant food in the soil.

In applying fertilizers or manure it should be understood that the common practice of placing them close to the trunk of the tree does not give the best results. The feeding roots are, for the most part, even beyond the ends of the branches and in old orchards occupy practically all of the soil. Hence, when the branches practically interlace, it will be best to cover all of the soil except within two or three feet of the trunks of the trees. The rule of placing the fertilizer where it can be most readily secured by the roots is a good one. Just how much fertilizer should be used and the frequency of application should be determined by the growth of the trees.

Pruning the Orchard.—In very few operations do we notice so marked a tendency toward extreme methods as in the pruning of orchards. While some advocate and practice growing the trees without any pruning whatever, others carry it too far and by cutting away the lower branches and thinning out the tops, leave but a mere skeleton. This is particularly noticeable in many of the older orchards. There are objections to both of these methods of pruning. When the former is used the number of buds is so great that the growth of the new shoots is necessarily very short; besides this, the heads are so thick that the sun can not penetrate and as a result the inner branches die. The circulation of the air is also impeded and everything tends to promote the development of fungi and injurious insects.

When pruning young trees, the idea should be to form a frame-work upon which the branches that go to make up the head of the tree can develop. Trees with low heads are particularly desirable when it comes to pruning, spraying, thinning and gathering the fruit. The expense of these operations can be reduced nearly one-half when the first branches are not more than two feet from the ground as compared with other trees that have six-foot trunks. For peaches, pears, plums and cherries there is no occasion for having the trunks more than two feet high and less than that will often answer, while for apples, three feet will be preferable to four or five. Low heads are often objected to as interfering with cultivation, but if proper attention is paid to the starting of the branches there will be little difficulty in working as close to the trunks as is desirable. If orchards are to be mulched, low heads are particularly desirable, as the branches themselves will shade the ground and both reduce the evaporation and check the growth of the grass between the

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trees. While the trees are young care should be taken to keep the heads symmetrical and, with most fruits, the branches should be headed back if they make a growth of more than eighteen inches. As this tends to make the heads thicken up it should not be carried too far, and all surplus shoots should be removed. After the first two or three years, trees that have been started properly will require but little pruning except to remove water-sprouts and branches that are so close together that they will be likely to rub together as the trees get older.

Spraying for Insects and Diseases.—Although the other operations mentioned are necessary if one is to obtain the best results from an orchard, there is no one thing that will add more to the health and productiveness of fruit trees than thorough spraying. Ordinarily the treatment necessary is such as will control the fungous diseases and the chewing insects. Occasionally, however, trees are attacked by the San Jose scale or other sucking insects, or by borers, and for these prompt action must be taken. Fruit trees should be examined once or twice in the fall and again in the spring for borers, which should be carefully dug out. For the San Jose scale nothing is more effectual than the ordinary sulphur and lime mixture. This should be applied very thoroughly while the trees are dormant. The late fall or early spring, just before the buds start, being preferred for the destruction of this insect.

When the trees are sprayed for the San Jose scale, using sulphur and lime, no other treatment will ordinarily be necessary previous to the appearance of the blossom, as this is one of the best fungicides known. For the control of the chewing insects and fungi the trees should be sprayed with Bordeaux mixture and an arsenite. The usual formula for Bordeaux mixture is four pounds of copper sulphate and 6 pounds of lime in fifty gallons of water. To this from five to eight ounces of Paris green or arsenite of lime should be used for the earlier applications, but arsenate of lead will give better results for the last application in June, and, if the trees are sprayed about the first of August for the second brood of codling moths, it should be used at that time also at the rate of three pounds for fifty gallons. This makes the cost about six times as much as when Paris green is used, but as it possesses superior adhesive power it gives far better results. Unless the sulphur and lime is used, all trees should be sprayed before the blossoms appear, as there are numerous fungi that attack the flowers and young fruits and serious harm results unless a fungicide has been used. It is not uncommon to have an apple crop destroyed by the development of apple scab, and a peach crop is often lost from leaf-curl in seasons when the weather is cold and wet. As soon as the fruit has set, a second application should be made and this should be repeated at intervals of ten days if the varieties are likely to be injured

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by fungi. Under favorable conditions, so far as the weather and varieties are concerned, it will not be necessary to spray more than twice after the blossoming period, but one or two more applications can often be given with profit to apples and pears that are subject to the scab, and to plums that are likely to rot.

In order to secure good results from spraying, it is of the utmost importance that the applications be thorough enough to reach all parts of the trees, as portions that are not covered by the spraying mixtures will not be protected. The applications for the chewing insects and fungi must be made previous to the appearance of the pests, as the treatment is a preventive rather than a cure. In order to cover the trees thoroughly it is best to make use of a mist-like spray. To obtain this, nozzles with small openings should be used and the pump must be one with which a pressure of not less than eighty pounds can be readily secured.

While any of the best class of barrel pumps will answer for small orchards, it will be found economical if much spraying is to be done, and especially if the trees are large, to make use of some form of power apparatus. There are various kinds that are adapted to the purpose, all of which have their advocates, but none of them are without defects. Among the power outfits that are being quite generally introduced in some sections are those that depend upon power furnished by sprockets upon the hind wheels. This is perhaps the cheapest of all powers for the purpose, but some of the machines do not give sufficient pressure to spray large trees without going over them the second time. Care also must be taken to keep the valves and other working parts in good condition.

Another form of power sprayer is the one which utilizes a gasoline engine. These are especially adapted to the spraying of tall trees and with proper care will do the work without serious interruptions. However, in order to run them properly one should be something of a mechanic and familiar with machinery as, at best, they require considerable care, and unless one is able to keep them in good shape and to detect the trouble in case they refuse to work, serious delays may result. Among the other objections to the gasoline outfits, we may mention the cost, which is about double that of the sprocket-wheel sprayers, and the weight of the engine which must be hauled about.

The gas spraying outfits also have many friends. The power is furnished by tubes of carbonic acid gas under very high pressures, and it merely requires the turning of a valve to secure any pressure desired in the tank which contains the spraying mixture. This is of heavy boiler iron and generally holds about 100 gallons. A fifty-pound tube of gas will furnish power for the application of about 700 gallons of spraying mixture. This makes the expense for power with this kind of an outfit

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about one-half cent for each gallon applied. Among the good points of this form of spraying outfits is the fact that there is no machinery to get out of order, and, as turning a valve is all that is necessary to operate it, a mechanic is not required.

Experiments for fifteen years or more have shown conclusively that when fruit trees have been properly sprayed they will be practically free from the attack of insects and diseases. The character of the weather and the conditions under which the trees are growing will, of course, modify the results to some extent, but the benefit of the spraying will, under fairly favorable conditions, be from five to ten times the expense, and as it will sometimes be possible to save the entire crop or even the trees from destruction, a much greater return will be secured.

While we believe that no one thing in the care of an orchard has more to do with its success than spraying, it must be understood that the results from the spraying will be greatly increased if the trees are growing under favorable conditions and if they have had proper care so far as tillage, supplying plant food and pruning are concerned.

When one has opportunity to note the difference between the results secured in orchards that have been neglected and have received little or no care and what can be secured when trees are grown under suitable conditions and have been so handled that they have given maximum results both in the quantity and the quality of the crop, it is difficult to understand how any one can attempt to grow a commercial orchard and not give attention to its proper care.

Mr. Swaim: How many times would you use arsenite?

Professor Taft: So far as the codling moth is concerned I would like to spray, after they have blossomed, twice, then you could leave it out of the third spraying. I am very cautious about giving dates here, but we find it very desirable to spray our winter apples during the first ten days of August. I would prefer to spray about the fifteenth, were it not for the fact that I do not like to have the lime on the fruit, hence I spray as early as possible for the second growth of codling moth, and if that is done before the fifteenth and we have rains in September the fruit will not be seriously affected by the spray. I do not think it is requiring too much to insure the crop to spray so many times. I do think, however, that three times or even four times spraying would be profitable in the average season. Once before, then within a week after they have blossomed, and then again about two weeks after that, and then if you have the codling moth bad, spray again. If you are equipped with the machinery for spraying I do not think it costs you much more to spray three or four times, and you will get it back in the returns. I think five applications will afford good returns.

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A Member: What do you consider the best sprayer?

Professor Taft: That is a pretty hard question to answer. I have been testing several kinds and I do not like to mention any one kind as my choice, because it depends on the man a great deal, and also upon the trees and the conditions. I might say that where one has trees that are not very large—if he is going to spray cherries, or plums, or peaches, I think the average fruit grower will like something like the Wallace sprayer. There the power is taken from the wagon wheel, and this can be operated on anything like firm land without any trouble, and you can get up pressure very quickly and do excellent work. We have had them in use in Michigan, but some of our largest fruit growers think they do not do the work quite so fast as a gasoline engine, but others find that they would rather have two of these than to have a gasoline engine. The cost of two would be no more. If the large growers have a man that is a good mechanic they can use the gasoline engine all right, but it takes a mechanic to run them. Some use the large jumbo pumps and still others have special pumps made to go with the engine, but it depends on the owner as to whether they get good results. If the machines have proper handling they give no trouble, but there must be some person who is a good mechanic to look after them. For the past year we have been using the Niagara Gas Sprayer, and it has many good points. This has no machinery, and nothing that will wear out. The material for spraying is placed in a very strong tank (the one we use, made by this company, has a tank holding a hundred gallons), that is four feet high and three feet in diameter. This is filled with material, whatever material you use, and a drum that is charged with carbonic acid gas, just as they use them at soda fountains, is attached by hose connection to the tank and furnishes the power. This is very simple. The difficulty with this, and I hope it will be overcome, in part at least, is the expense. For instance, we have to send to Chicago to have a drum holding 50 pounds shipped from there, and it costs us about three dollars to four dollars, and sometimes more, so it costs us from one-third to a half cent per gallon for our power, but we can get along much faster than to use the hand pumps that are working in first-class condition. We have had trouble in one instance in getting the gas, as it came about three weeks late (but it was our fault), when the spraying was all over. Then we had to go back to the hand pump. As you know, I have been using the Deming pump.

A Member: Do you think the only disadvantage would be in the cost of the gas?

Professor Taft: We only had trouble in the delay of our gas. It

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was a mistake in the office, but of course it affected us just the same. The machine works perfectly, and I can see no trouble whatever. We did have trouble once. We used about half of a tank and left it out in the sun at noon and the thing blew out the diaphragm; that was the safety valve. There was no serious harm done, only we lost our gas.

Mr. Zion: The uncertainty of getting competent and reliable labor makes it almost impossible to operate gasoline engines in the orchard.

Professor Taft: Anyone can use this machine. You only have to fasten a hose to it, turn a valve, and go to spraying.

A Member: What does it cost?

Professor Taft: About a hundred dollars.

A Member: What kind of an outfit have the spray motor people?

Professor Taft: They have a gasoline engine that works their pump, and I have had good reports from it, but I would not say what it is from experience. There are quite a number of firms making gasoline engine outfits, and except for the matter of mechanical skill required to operate them I like them very much for a large orchard. We have used them three years, and if handled properly they are all right, but sometimes they have given us trouble. Sometimes they will work day after day without attention.

A Member: What horsepower would you recommend?

Professor Taft; About one and a half answers pretty well. It depends on the kind of a sprayer you have.

Rev. Smith: What do you consider the proper distance apart to plant trees?

Professor Taft: I do not like to give advice so far away from home. For our work in Michigan I like to plant rather closely and then take out every other tree. I like to plant them twenty by thirty feet to start with and then take some out and leave them thirty by forty; this gives them room. I do not like the triangle method as well as I do the square, because the latter gives us more room for cultivation or spraying in the orchard. I wouldn't recommend any specified rule for distance. I would say that twenty by thirty gives the trees a good chance for a number of years and then you can take every other one out. If you have good soil and feed the trees properly you can often plant quite closely, and by heading back you can secure very good crops of fruit. We have one orchard, a test orchard, put out for that purpose, only a rod apart; they were put out in 1890, and have been bearing for eight

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or ten years, and we have been cutting them back and have the trees in nice shape, and we get from each of the four trees perhaps half a barrel or a barrel of fruit, and we couldn't get that from a single tree. This of course is an extreme case for a test. We have our trees close together, but whenever they begin to touch we cut them out.

A Member: Have you had any experience with the dust spray?

Professor Taft: Some, and I have not been satisfied with it for an apple orchard. So far as the scab is concerned if used thoroughly and properly it does pretty well, but not so well for the codling moth. After a rain it is all gone. I have had very little success in preventing scab with a dust spray.

Rev. Smith: Did you ever put carbolic acid in the mixture for the sake of keeping insects away?

Professor Taft: I have used it with the dust spray, but I do not believe the results are lasting enough in the case of the codling moth to make it worth while to use it. I might say for the dust spray that we had very good success with it in dusting plum trees; in fact, before we ever heard of the dust spray itself we used to use practicaly the same thing, except we would shake the dust over the tree. That is not so good as to blow it, but it gave good results. It will control curculio and the cherry slug, and things of that kind very nicely.

A Member: If there are frequent showers after using any mixture you have to spray again, do you?

Professor Taft: Yes, but it depends upon the shower. If it is a light rain, all right, but if it is a hard one it is almost all gone. But if it has had a change to dry a little and there is only a slight shower the material is not washed off.

Mr. Kingsbury: Have you succeeded in keeping the scab from the New Town Pippin?

Professor Taft: We do not grow that very much, but the Snow is just as bad and we have succeeded with it.

Mr. Kingsbury: You ought to have it; it is a fine apple.

Professor Taft: Yes, I know it is. I am sure if you keep an apple covered with Bordeaux there is no chance for scab to grow. The scab is a living plant coming from spores, and if there is an infinitesimal thin film of sulphite covering the apple there is no chance for the spore's development.

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Rust is not connected with scab in any way. As I said last night, I like to use lime. The usual formula calls for equal parts of lime and copper sulphate, and while I use four pounds of copper sulphate, and six pounds of lime and fifty gallons of water, when I spray the apple and other fruits in August I will reduce the amount of lime.

A Member: Would you reduce Paris green?

Professor Taft: Yes, in the same proportion.

Rev. Smith: What do you think of kerosene emulsion?

Professort Taft: For spraying trees infested with insects like plant lice it is all right, but I would not attempt to control the codling moth with it.

Professor Hollister: I would like to ask if Professor Taft knows of good results coming from the use of sulphate of iron on pear trees?

Professor Taft: I have used it some, and it may be all right, but I would not think it is economy to use it when you have to pay the ordinary price for it.

President Stevens: We will stop this discussion here and hear from Professor W. J. Green of the Ohio Experiment Station, Wooster, Ohio, whose subject is along the same line and the discussion can be had then. I have the pleasure of introducing Professor Green.

SOME COMMON ORCHARD INSECTS AND HOW TO CONTROL THEM.

BY W. J. GREEN.

The orchardist approaches the insect problem from quite a different direction than does the entomologist. The latter studies the life history as much, or more, for scientific reasons than for practical results. The fruit grower cares for life history only so far as it enables him to fight the pests of the orchard, but practical remedies concern him more than anything else. How to prepare these remedies—when and how to apply them, are the real problems which he studies. He depends upon the entomologist to tell him where the weak points in insect life are, and perhaps to indicate some good remedy, but the method of procedure he is quite willing to investigate for himself. It is true that the practical man does not object to having the man of science work out prac-

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tical details, but if he is willing to do anything at all for himself it is simply along the line of practice.

He seldom makes any attempt to go further than this, nor would it be wise for him to do so, although a more thorough knowledge of insects, both good and bad, would often be of great service to the fruit grower. Entomologists have often worked out details in methods of operation which have been of great value to fruit growers, but it is not really so essential that they do such work as that they study more closely the habits of insects which affect our crops. Years ago entomologists told us that the codling moth lays its eggs in the calyx, or blossom end of the apple, and that the time to spray is soon after the blossoms fall, and while the apples still stand in an upright position. This theory, or explanation, seemed so plausible that we all thought that there was little else which we needed to know in order to carry on a successful warfare against the apple worm.

Both entomologists and horticulturists went at the work joyfully, full of faith and hope. Apparatus and methods were perfected, but expectations were not realized. The spraying, even though the directions were carefully followed, did not give the expected nor desired results. Something was wrong and the majority, especially the entomologists, laid the blame to imperfect work. Fruit growers worried over the wormy apples for years. Many tried the very best they knew how to do good work and yet were obliged to be content with 25 to 50 per cent. of wormy apples. I recall how a dozen years ago I stood before an audience of fruit growers and a few entomologists and stated the fact that spraying for the codling moth did not give satisfactory results, and that I believed that a more careful study of the habits of the insect was needed. Some of the most prominent and successful fruit growers present agreed as to the unsatisfactory results, but none of the entomologists admitted the insufficiency of our knowledge regarding the habits of the insect. What I said had not the slightest effect, except to put me into the class of those who do not know how to spray fruit trees. A few years later it was found that all of the eggs of the codling moth are not laid in the calyx of the apple, nor even on the fruit, but often on the leaves.

Basing upon our first imperfect knowledge, we worked upon the theory that early spraying, or soon after the blossoms fall, is about the only application that can do any good.

But few efforts were made to poison the late brood, because we thought that it could not be done and was even dangerous because of the poison left on the apples.

This bit of history illustrates the importance of accurate knowledge of the habits of the insects with which we are to deal. We must de-

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pend upon the entomologist for this knowledge. We are greatly indebted to them for past favors, and we should not try to belittle their work, but if we could impress upon them the fact that the true scientist is glad to see his most prized structure tumble into ruins if there is a flaw in the workmanship, rather than have it stand as a reproach to his carelessness and inaccuracy. If the foundation which the entomologist builds for us is defective our structure must fall. We are all too prone to try to bolster up a tottering structure in the form of a pet theory. We have not enough of the scientific spirit which loves truth for truth's sake. Horticulturists are as great sinners in this respect as any other class, hence they can not throw stones. A false assumption on my part, a bad theory, kept me from making an advance which should have been made.

My first real work in spraying experiments was in controlling the apple scab. At once I saw the advisability of using combined mixtures of fungicides and insecticides. So strongly was I impressed with the importance of this method that for the time being the fact was lost sight of that, in some cases, it is better to apply insecticides and fungicides separately. I was simply trying to bolster up my theory, and in doing so used the Bordeaux mixture too freely. More than three applications gave a russet color to the fruit. Had I not been hampered with the belief that combination mixtures should always be used, I might have begun earlier to take advantage of the hints regarding the value of the late spraying for the codling moth when they were first made a few years ago. Of course I knew of insecticides which might be used alone, but not until three years ago did by own results fully satisfy me that late sprayings for the codling moth are of value.

It is not necessary to go into details regarding the results secured at the Ohio Experiment Station, in various orchards operated upon in different parts of the State. When no sprayings are made for the apple worms, about half the apples are usually wormy. Three sprayings, made at the usual time, reduce the percentage considerably, often one-half.

Three sprayings with Bordeaux are about all that can be made without injury to the apple; besides, that number is sufficient to keep the apple scab in check.

So far as the effect upon the worms is concerned, we get almost as good results if we omit the three sprayings altogether and then give two about the last of July and the first of August. The last season where there were 46 per cent. of wormy apples on unsprayed trees, one spraying on July 26 and another August 10th reduced the per cent. to 26, the early sprayings being omitted. This shows that late sprayings are of value.

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When we make the early applications as usual and then add two more, the last being about the middle of August, the result is most satisfactory. When the crop was good the percentage of wormy apples has been often reduced below 5 per cent., and in some cases not a single worm could be found. When the crop is very light the result is not as good. Under favorable conditions it is possible to secure 95 per cent. of perfect apples, free from worms, with five sprayings, and this where 40 or 50 per cent. would be wormy if they were not sprayed. We have found the arsenate of soda in Bordeaux Mixture to be satisfactory for three applications. To make the arsenate of soda use two pounds of commercial white arsenic and four pounds of carbonate of soda. Boil together in a gallon or more of water until dissolved. For a 50-gallon cask of Bordeaux take one-eighth part of this solution, which gives four ounces of white arsenic to fifty gallons of Bordeaux. This is the cheapest form of arsenic, except arsenate of lime, and is convenient and satisfactory. Some have used arsenate of lead, alone or in part, with Bordeaux, but experiments do not show that anything is gained by so doing. We have tried using Bordeaux and arsenate of lead separately, but with no marked results. It has been thought that possibly the Bordeaux Mixture may have some mechanical effect by which the poison may be concealed by the lime, or the lime by acting as a repellant may keep the worms from eating the poison, but this does not appear to be the case, or at least the effect is not appreciable.

It is now well known that the codling moth is active in this latitude during the latter part of June and all of July, August and September, and even in October. We know, also, that the worms can be poisoned whenever they are present—that is, that late spraying is effective. It is then simply a matter of detail as to manner or method of dealing with the pest.

Most likely seasons differ as to the best time for spraying in any given locality, but in this latitude the middle of August can not be far from the right time for the last application on late varieties. Of course, some of the material will stick to the fruit until picking time, but most growers would rather have sound apples to wipe than wormy ones which are not worth wiping.

It is not well to continue the use of Bordeaux Mixture up to this date, hence if five applications are made during the season the fourth and fifth should be with arsenate of lead, more commonly called Disparene, alone. Three pounds to 50 gallons of water is a sufficient quantity. This may be used during the entire season in place of arsenite of soda, but is more expensive. In case San Jose scale is present in the orchard, lime and sulphur will need to be applied before the leaves open.

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This acts as a fungicide and will take the place of one spraying with Bordeaux. If any of the sprayings must be omitted probably the last one with Bordeaux is the least important.

The question of the effect of grass in the orchard as affording a hiding place for apple worms is often raised, but my observations have not enabled me to form an opinion on the point, as I have seen no difference between cultivated orchards and those in grass. Banding the trees, pasturing with hogs or sheep are remedial measures long ago advocated. No doubt they have value, but far less than thorough spraying. The worms leave the greater share of the apples before or very soon after they fall, hence hogs and sheep do less good than has been supposed. An orchard used as a sheep pasture presents a tidy and pleasing appearance, but the sheep need to be kept in sufficient numbers to consume the apples as they fall, and this leads to very close cropping of the grass and leaves on the lower branches, which is not a desirable condition in dry weather. The value of hogs in the orchard has been much over-rated, and it is probable that just about the same amount of spraying will need to be done with the hogs in the orchard as out of it.

Thorough spraying is to be depended upon to hold the codling moth in check, while pasturing with live stock is of doubtful utility, and it is wise to hold fast to that which is known to be good.

Regarding the apple curculio the case may be different. Clean culture may be essential or advisable in the treatment of this insect, but my experience has not enabled me to determine the difference between cultivated and uncultivated orchards as regards the depredations of this insect.

Concerning the plum curculio, it would seem, according to theory, that clean culture should be given.

We have, however, seeded our plum and peach orchards to clover and grass. We had the curculio to fight before and we have just about the same amount of trouble with it as we did; certainly not more. It was announced by the Ohio Station nearly fifteen years ago that the curculio can be controlled by means of spraying with arsenites. This claim has been both confirmed and contradicted. In practice we now use two methods. Plum trees need spraying with a fungicide to keep the foliage in health, and we make three or four applications of Bordeaux and arsenite of soda combined, the latter being for the curculio. In some seasons this holds the curculio in check quite well, but not always. Having a large number of varieties, it of course happens that some are more susceptible than others to the attack of the curculio, and there is also a great difference in the crops on different trees. This

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makes it impossible to treat all alike. We depend mostly upon the spraying to hold the curculio in check, but here and there a tree needs to be jarred; some seasons a few and at other times a considerable number. It is evident that the spraying does much good and saves a great deal of work with the curculio catcher. In an orchard of only a few varieties and with a good crop spraying may be depended upon almost wholly.

If the spraying were for the curculio alone there would be less reason to urge this method in place of the catcher, but the use of a fungicide is necessary in any event, and the addition of poison for the curculio increases the cost but a trifle.

The use of a fungicide for the plum rot is not always attended with complete success, but some good is accomplished and more in keeping the foliage healthy, thus preventing premature leaf dropping. For this reason the combined mixture can not be too highly recommended for plum trees.

The foliage of the Japanese and American sorts is rather tender and will not endure the same strength of mixture as the European kinds. The same is true of peach trees.

Cherry trees need the same treatment as plum trees and for similar reasons, although a less number of applications can be made on account of the early ripening of the fruit.

The San Jose scale is regarded by some as the most to be feared of all orchard pests. It has done much harm and is capable of still greater damage, but to the thoroughgoing orchardist it is not a serious menace. It costs far less to keep the scale in check than it does to control the codling moth, the apple scab or the plum curculio. It is not so much to be feared in the apple orchard as the canker worm and the combined troubles in the peach orchard other than the scale give more worry than does the scale. Like the smallpox, everybody is afraid of the mere name. To the wideawake fruit grower the San Jose scale is a blessing. It makes him take better care of his trees. Like the doctor and the lawyer, he profits by the misfortunes of others. We can not ignore the scale, however, and we must deal with it as a serious if not the most serious orchard pest.

My first experience in fighting this pest was with crude petroleum, and I would still use the material were it not for the fact that the lime and sulphur compound is a fungicide as well as an insecticide. Considerable damage has been done to peach trees with crude oil, but such damage can be avoided. It is not the material for every one to use, however, and can be recommended to none but experts in spraying. The lime and sulphur compound is safe, efficient, and serves a double pur-

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pose, hence comes nearer fulfilling all requirements than anything else. In preparing this compound we use 15 pounds each of lime and sulphur to 50 gallons of water, leaving out the salt and copper sulphate. Fall applications may be just as good as if made in the spring, but there are some practical difficulties in the way of doing the work in the fall.

The leaves of apple trees often remain on too long in the fall and the work is apt to be delayed. It is necessary in the fall to see that the material is all drained from the pump and the pipes every night, and if there should be a little snow on the ground and a nozzle should clog, or anything else delay the work, the material inside the hose which lies in the snow becomes so cold as to necessitate emptying the hose before commencing to spray again. On frosty mornings one must wait until the sun melts the frost from the branches and they become dry, before beginning work. When the spray freezes on the trees the material spreads unevenly and this is quite apt to occur late in the fall.

In very bad cases it may be well to give one spraying in the fall and another in the spring, but if one has not too much to do, and is reasonably sure of being able to do it in the spring, he would better wait until that time. I have sprayed peach, plum and apple trees with lime and sulphur when the blossom buds were showing color—in fact, were just ready to burst open—without damage, and with even better results than with the earlier applications. Peach trees sprayed at that time showed hardly a trace of curl leaf.

The apple scab fungus is also greatly checked if sprayed at that time. It would not be safe, however, for large orchardists to put off spraying until near the time of blooming.

It is best, in most cases, to make two sprayings with lime and sulphur. One can be made earlier and the last delayed as long as seems safe. Such thorough work can be done that it is difficult to find any scale the first season after spraying, but it is not safe to take it for granted that no scale is present, as there may be enough to make a very bad infestation before fall. A case in point of actual experience illustrates this. Some badly infested trees were sprayed with the utmost care, and those trees standing nearby where but few scales could be found were sprayed in the ordinary manner. At the end of the season there appeared to be no scale on any of the trees and the application the second season was omitted. At the end of the second season those trees which had been badly infested, but thoroughly sprayed, were still almost free from scale, while the other trees that had been sprayed less thoroughly were almost coated with scale. All of the trees could have been kept comparatively free from scale with a spraying each year.

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Summer treatment with half and one-third strength killed some scale, but injured the foliage. Because of the necessity of getting the material on the branches, summer treatment, even though it did not harm the foliage, appears to be impracticable. The leaves are in the way and most of the material is wasted. In a very limited way badly infested trees might be treated in summer, but the orchardist could not afford to give treatment at that time of the year.

Unboiled lime and sulphur wash has not been satisfactory. The effect has been variable, probably due to the fact that the composition is variable because the chemical action can not be fully controlled without boiling.

A preparation known as Consol was of no value. Limoid, using 2 gallons of kerosene, 12½ of water and 9 pounds of lime, was about as effective as half strength lime and sulphur. Scalacide, 1 gallon to 20 gallons of water, was nearly as good as lime and sulphur. It has the merit of being easy to prepare and convenient to handle. If it were not for the Experiment Stations there would be almost an unlimited number of preparations on the market.

The destruction of infested trees may sometimes be advisable, but it has often been done when there was no need of it.

Thorough pruning is advisable before spraying for the scale, and in the case of badly infested peach trees which have been allowed to grow tall the first thing to do is to head in severely. Sometimes a mere stump is all that is advisable to leave, but more or less of the top should always be cut away. I have frequently removed the heads of peach trees in this manner, and always with good results. In case many twigs, or even large branches, are dead or dying because of the scale, cut back severely before spraying. A new and healthy top will be formed which needs only an annual spraying to keep it so. The removal of the top of some peach orchards in our State has been one of the good results of the prevalence of the scale. Some growers have thus been taught how to prune peach trees, but a great many have not yet learned the lesson. All kinds of fruit trees may be treated in the same manner, but the advantage is great in the case of peach trees. Spraying for the scale without pruning is apt to be very unsatisfactory work and accounts for many of the indifferent results obtained.

Inspection has done much good in our State, and yet many infestations are traceable direct to the nurseries. Inspection has made the nurserymen more careful, but the people are careless and the inevitable day is simply being delayed when every one who would grow fruit must spray.

In many parts of the State the canker worm has done more to dis-

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courage the apple grower than any other insect. Many orchards have been wholly or partly destroyed and the owners have given up trying to grow apples. But few have been successful in combating this pest, although many have made an effort to do so. The ordinary spraying with Bordeaux and arsenite of soda has not been sufficient to hold the canker worm in check when it has once become fully established. In my own work arsenate of lead, or Disparene, used alone, has been more satisfactory than anything else. I have not succeeded with this or any other remedy, and have heard of no one who has when the first application has been delayed until the worms have reached a half inch in length or more.

The only time to spray successfuly for this pest appears to be just as soon as the first worms can be seen, or even before. Arsenate of lead sticks so well that it may be put on a little in advance of the coming of the worms, but at that season the foliage is expanding rapidly, hence another application must be made within a few days of the first. Of course it is possible to make the spraying for the codling moth answer in part for the canker worm, but one must watch sharply for the appearance of the first worms and then apply arsenate of lead, regardless of what has been done for other insects. The canker worm needs special treatment, just as though it were the only thing for which to spray. After it is once under control my experience has been that the ordinary spraying will hold it in check.

There seems to be but little danger of the canker worm successfully invading an orchard that is well sprayed. I have never heard of such a case, and yet one observation leads me to believe that there is a possible danger of this kind in rare cases. The remnant of an old orchard was badly infested and the worms multiplied to such an extent that the supply of food became exhausted. The worms mounted the board fence and were seen traveling along it in a lively rate hunting for fresh pasture. In case a fence leads directly past an uninfested orchard the latter might become stocked in one season to such an extent as to cause considerable trouble.

As a rule, canker worm infestations increase slowly and give the orchardist ample time to check them. One who is really giving his orchard the needed attention in other respects has no reason to fear an invasion of canker worms. Their presence always means, now that we know how to spray, carelessness and neglect.

Some have used Bodlime on the trunks of trees with good results. A very bad infestation is probably most easily treated in this manner.

The Bodlime must be put on in February or March and needs frequent atention, as the surface may become somewhat hardened by ex-

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posure. When the moths are very numerous they may even bridge over the Bodlime. In either case all that needs to be done is to go over the Bodlime band with a paddle so as to make a fresh sticky surface.

By the use of this material, and by thorough spraying, the canker worms may be so nearly exterminated from an orchard in one season as to give no further trouble. They will need no special attention thereafter, as the ordinary applications for the codling moth will be sufficient to prevent the increase.

Fruit growing is naturally falling more and more into the hands of specialists or professionals, and the San Jose scale is hastening the transformation. This may seem to be the natural and desirable end to one who makes his living by growing fruit, but nothing is desirable which is not for the general good.

To be surrounded by fruit trees, flowers and all kinds of plant life has much to do in making a happy home. It would be sad indeed if all but professionals were to give up fruit growing. Such a time will not come, but fewer people than now will feel willing and able to grow fruit simply for their own use. There will always be some one who will do so, and while there may be a falling off in numbers of private fruit growers for a time, it is probable, indeed almost inevitable, that amateur fruit growing will before long receive an impetus from the very forces which now seem to be working against it. Not every one who has a few trees in his garden is going to give up the battle and admit himself defeated by an insignificant scale. There are those who will take pride and pleasure in conquering. As the battle grows hotter the pleasure of victory will be greater. The success of a few will stimulate others, and fruit growing will rise to a higher plane. When that time comes such societies as this will have a different work to do. They must get out of the rut of commercialism, at least a part of the time. They must consider fruits of quality as well as those of quantity.

The standard of excellence will be raised; the exhibits will be improved; the discussions will take a wider range; new people with new ideas will come in, also others who are seeking ideas. City people are becoming more and more interested each year in fruit growing and in all lines of horticulture. Some of these fail to realize their expectations and give up in disgust, but others succeed, and the greater the effort required the greater the rewards. The rewards for this class are not pecuniary altogether, but to one with a competency there are other benefits better than that. The stimulus to effort which obstacles give will make amateur fruit growing a delightful and healthful occupation to those who have made money and lost their health in the city. The

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difficulties of both amateur and professional fruit growing must increase in the future, and so will both pleasures and profits.

Of all pests to the orchard now known, the San Jose scale will contribute more than any other to this change, but all of the adverse forces are working together to the same end.

The influence of amateur horticulturists will be not only to put horticulture on a higher plane, but to increase the appreciation of good fruits among the people. The tendency will be to educate the tastes of the people. Fruit growers ought to be alive as to future possibilities. They have something more to do than to plant, to till, to spray and to prune. The result of their labors must be something more than bushels of beautiful fruit. Consumers are beginning to want good fruit and before long they will demand it. This is one of the things to which fruit growers ought to give more earnest heed at present, for the new order of things may be upon us before we are fairly aware of its coming.

Mr. Walker: What is the best thing to protect the hands and face when using lime and sulphur.

Professor Green: Rubber gloves would protect the hands, but I don't know what to use for the face.

Mr. Voris: Why wouldn't it be a good idea for some one to get the apparatus and go around and spray for the farmers just like the threshers look after their wheat? They could charge so much per tree or acre. Wouldn't that solve many of the difficulties that the smaller grower encounters?

Professor Green: I think in many localities that might be worked out all right, but in others it would not work so well. That has been done practically in two or three places in Ohio.

A Member: How much pressure do you require?

Professor Green: About eighty pounds. One hundred will do better. There is danger, however, of bursting your hose.

A Member: What kind of a tank would you use?

Professor Green: A galvanized iron tank similar to the water tanks.

A Member: Won't copper sulphate corrode it?

Professor Green: Yes, it will in a few years, but you can't very well help that. Copper or bronze tanks are too costly and lack in strength.

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Mr. Kingsbury: I think we have had two most valuable discussions, and I think for the good of the horticulturists of the State they should be printed at once and put into the hands of the members before the beginning of the next season. The rule has been to postpone the publishing until the following year, and sometimes longer, and this is very unwise it seems to me. We have lost a great deal of interest by delaying publication, and I would suggest that some measures be taken to have these two papers at least published within the next two months.

President Stevens: I think the suggestion is very good, and if the Indiana Farmer will do the work I would suggest we hand them over to that paper at once.

Mr. Kingsbury: We could not publish them in full. Either one of these would take up the entire edition of the Indiana Farmer.

Secretary Flick: I will say that it is my intention to issue a bulletin including these papers, and the discussions on the matter of spraying and taking care of orchards, and also, if we can get the papers together, the one on potato growing. We mean to get these into your hands before the coming season.

President Stevens: We have probably spent all the time that we can spare at this time on this subject. We could keep up these questions with profit if we had all day, but we must hurry through the program. We will now listen to William W. Waltman, Nashville, Brown County, Indiana, on "Commercial Orcharding in Brown County."

COMMERCIAL ORCHARDING IN BROWN COUNTY.

BY W. W. WALTMAN.

Mr. President, Ladies and Gentlemen—I suppose you think that it is rather peculiar that one county in the State has been picked out as above the rest, and a man selected to give a description of Brown County. Now, I am a stranger to you, because in looking over this crowd I see very few faces that I have ever seen before, and very few who have ever met me in Brown County, but there are one or two here who have seen me there, or I might tell you a big story about Brown County, but I fear they would tell me it was out of order.

Brown County is so far from here that you seldom ever get there, and yet, it is nevertheless true, strange as it may seem, I can stand on my back porch and see Crown Hill, near Indianapolis! Brown County is divided into ridges, what are called rough, hilly country ridges, run-

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ning east and west, or nearly so, and on these ridges there is very beautiful scenery, and very fine places for orchards.

Brown County has something that no other county in the State has. We can boast of this, and that is, that we have the growing seasons for five to eight weeks longer than you do up here. This may seem strange, but nevertheless it is true. I have seen statements made in your paper that the strawberries were just beginning to come from the southern part of the State, when I have had them from my own patch on the table as much as two weeks before that time. Now, why is that? The reason is we are on elevated land. Brown County is mountainous. It is about eleven hundred feet above sea level in some places, and on top of those hills we have the advantage of three or four weeks in the growing seasons. Now, that is quite an item for fruit growers, especially small fruit growers.

I have heard quite a lot of discussion about how to conduct your apple and peach orchards, and all that, but that is like getting the receipt for cooking a rabbit, but you must get your rabbit first. In the first place, you must get suitable soil, and we have it in our part of the State, and it is cheap, too. Land is cheap down there now, but is not going to be so long, because this opportunity to get cheap fruit land is becoming known and the people throughout our section are beginning to take advantage of it, and people from some other parts are coming in. We have a railroad penetrating the great Switzerland of Indiana, and yet, contrary to all previous opinion and to railroad officials' astonishment, when they began to build the railroad they found, at the same cost, they could construct two miles in Brown County where they could construct a mile in Johnson, and four in Brown where they could construct one in Monroe. I was born and raised in Brown County, and in my early experience I found it was an excellent place to grow fruit trees. We used to have large trees in the forests like the gentleman made an appeal for last night, but they have been cut away and destroyed, but the hardest thing we have to contend with is the timber growth in our orchards. The forest sprouts want to grow. We have a quantity of land that is fine for small fruit, such as blackberries—they grow wonderfully. We have to fight them to keep them from taking us totally. The farmers could produce bushels and bushels of berries if they would just let them alone. That is not true all over the county, but is in the northrn part. There is one ridge especially that is better for berries, and there are other places where they will not grow well. Our soil is good for apples and peaches, because it is sharply undulating and it does not get so cold on the elevations in the winter. There is a difference in the atmosphere there, for we have tested it with a thermometer. My house is on a hill, and not

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a mile away in the valley there will sometimes be many degrees difference. On the mountain in the cold weather it is from fourteen to twenty degrees warmer than it is in the valley. This gives us an opportunity to grow peaches. And if you don't want to grow peaches and apples it is the nicest place to live in the State. You get the pure atmosphere and it makes you strong and healthy. We would enjoy having you people come down. We are very hospitable, and when we go away from home and come back sometimes we find strangers have taken possession. We never put a lock or key on the doors. Everything is all right. I should like for you to come down, and I would like to hit you in the mouth with a Ben Davis apple. I have an orchard of six thousand trees. I started about the first commercial orchard down there. We have one at Nashville with two thousand trees, and another one with about seventeen thousand trees. This man is east of me. There was one man came down there to see our land and he said he felt so good he wouldn't leave, and so he has an orchard. This is the territory for those who desire to raise fruit. I think we ought to exchange goods. Here in the black ground where you can grow corn and hogs, grow them, and let us have some, and we will furnish the apples and make the apple wine. (I intended to bring some up with me, but I didn't, and I expect it is best that I didn't.) But apples do make fine wine. The owners of land there should go into the fruit business. We have made a mistake for years in trying to make this land grow corn. We can grow some wheat, and we can beat you as far as quality is concerned, but the quantity is not so good. We have made the mistake of not growing more fruit on the hills. I bought my strip of land for the taxes. I put it out in trees, and I like it, and don't want anyone to come along and buy it. I don't believe I would take a hundred dollars an acre for it. There are hundreds and hundreds of acres of land down there that can be utilized in that way, and would help the business of the great State of Indiana. All over the southern part of the State there is a clay soil, varying in depth and composition. In some places you will dig twenty feet before striking stone, and other places it is near the surface of the ground. It is a good place to grow hardy trees. They will grow thrifty and will bear well. We want to get the better people interested. As to our Experiment Orchard, I would say that we can not experiment too much. I am in favor of our experiment station at Mitchell. Too many people want to see the results of these experiments too soon. If we do the next generation good by our experiments we have done well, and should be willing to let them reap the rewards of our work. It displeased me when I heard some one say that our work has not been satisfactory down

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at the experiment station. If my children can reap the good results of those experiments I will be satisfied with what money it takes to run it. We expect the results to tell in two or three years on apples that it is going to take forty or fifty years to bring about. I think such a person as this would not wait for the strawberries to ripen. It is simply preposterous. Let's encourage them and give them our support, all the supjport we can, and if I can help you with the Legislature, and you need me here call on me at any time, Mr. President; send for Old Bill and he will come up.

My home seems to be a kind of a home for all of my acquaintances, and I think the lady over there can vouch for that. A great many from the State University come up there—the teachers and the professors. I have had apple wine for them to sample and not one of them knew but what it was first-class grape wine. One of them said that I went into the woods and picked wild grapes, because he had never tasted any so good. It is simply fine, and is very simple to make. You take good apples and make good cider, and set it down in the cellar, and add from two and one-fourth to two and a half pounds of granulater sugar to the gallon and let it alone. (That is the hardest thing to do.) Let it alone for two or three years. Let it work. The best way is to put a rubber tube in the barrel and the other end into a bottle of water. If you will do this you will have first-class wine and it will not cost you more than twenty-five or thirty cents a gallon.

I also have a receipt for keeping cider, and I have tried a great many receipts, but I like this one best. Some of them say to put lime into it, but that kills it, and like everything else in this world it must be alive or it is not good. This lime kills it and takes all the strength out of it. If you want good cider that will keep just fine, add one-half pound of graulated sugar, or one pound of sugar to the gallon and set it way, and you can just keep drinking it, and it will never go bad until all of the sugar is taken up; then it will sour.

Another thing we have down in Brown County, and that is birds. I am a great lover of them myself. And if we could teach the boys (and they are not all boys) not to come into the country and shoot these birds we would have still more of them.

Now, I must quit, but I want to extend an invitation to one and all to come down into our county and make us a visit. Come to my house, you won't have any trouble finding it, for you can see it for twenty-five or thirty miles in all directions. I wouldn't want over a dozen of you to come at once. My wife will take pleasure in entertaining you, and we will make it pleasant for you there. We have no upper tens or lower twos. We are all alike, and the only question we

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ask about a man or woman is, "Is he or she honest and industrious?" and if so, they are all right.

A Member: Do you require all of them to be sober?

Mr. Waltman: That is a queer question to ask a man from Brown County, when we never see any drunkards down there. Don't you know that we were the first county in the State that put the lid on? We have no saloons in the county.

Rev. Smith: That wine—will it make people drunk?

Mr. Waltman: It never has me. I can not say about others. I should like to say this: We haven't a prisoner in our jail. The sheriff gave the last prisoner who was in there the keys and told him to come in the jail to sleep, but come over to his house for dinner. We have a great deal of confidence in our citizens down there. We only have three or four persons in our poorhouse. We believe in making them hustle if they are able, but it is a homelike place for the unfortunate poor, who are well taken care of. Many people are afraid of us because they see in the papers that we "encore" with rotten eggs down there. You will not get them if you behave yourselves. That does occur sometimes, but the recipients invite and bring those things on themselves. They sometimes get smart and walk through the streets and ask where the theater is, and what time the train will come through, and that irritates the boys just the same as it would you. I was standing on the State House steps one day and one of my friends pointed me out to another man and told him I was from Brown County. He looked all around and seemed to be puzzled, and finally my friend said, "There he is," pointing to me, when the other man came up to me and said, "You look just like any other human being."

Secretary Flick: I am sorry to say that the subject of "Melon Culture" can not be presented, as the principal speaker has been summoned on a jury and the judge would not let him off.

I want to say in this connection that I have in my possession the seeds which were taken from an Indiana melon that weighed eighty pounds, grown near Decker, Indiana. I have one of these packages of seeds for each family, and I wish to announce that at the next State Fair the society will offer five dollars for the largest melon grown from this seed, which must exceed seventy pounds in weight, and be shown at the Indiana Horticultural Society's headquarters there.

President Stevens: I would suggest that on account of the length of the program for this afternoon that you come back at 1:00 o'clock. so that we may be through earlier this evening.

You may consider yourselves adjourned until 1:00 o'clock.

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THURSDAY AFTERNOON SESSION.

President Stevens: In order to expedite matters we will call for the report of the Committee on Awards. Is that committee ready to report?

Professor Troop: Mr. President, Ladies and Gentlemen—Your committee has the following report of

PREMIUMS AWARDED.

APPLES.

Best 10 varieties apples for home use—Samuel A. Hazelett, Greencastle, first	$5 00
Best 5 varieties for market—	
For Southern Indiana:	
Chris King, Rushville, first	5 00
Chas. N. Lindley, Salem, second	3 00
For Central Indiana:	
Walter S. Ratliff, Richmond, first	5 00
Reed & Fielding, Glenwood, second	3 00
Samuel A. Hazelett, Greencastle, third	2 00
For Northern Indiana:	
Wm. F. DeVilbiss, Fort Wayne, first	5 00
Best plate Astrachan—H. J. Hale, Indianapolis, third	50
Best plate Baldwin—Reed & Fielding, Glenwood, first	1 00
Best plate Baldwin—Chris King, Rushville, second	75
Best plate Baldwin—Chris King, Rushville, third	50
Best plate Ben Davis—Reed & Fielding, Glenwood, first	1 00
Best plate Ben Davis—J. F. Coffin, second	75
Best plate Ben Davis—Reed & Fielding, third	50
Best plate Black Ben Davis—Frank Moffett, Carmel, first	1 00
Best plate Benoni—Chris King, first	1 00
Best plate Clayton—Samuel A. Hazelett, first	1 00
Best plate Clayton—W. B. Flick, Lawrence, second	75
Best plate Dominie—Reed & Fielding, first	1 00
Best plate Golden Sweet—W. B. Flick, first	1 00
Best plate Grimes—Reed & Fielding, first	1 00
Best plate Grimes—Frank Moffett, second	75
Best plate Grimes—Frank Moffett, third	50
Best plate Hubburdston—Reed & Fielding, first	1 00
Best plate Indian—Chris King, first	1 00
Best plate Indian—Chris King, second	75
Best plate Indian—Samuel A. Hazelett, third	50

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Best plate Indiana Favorite—Reed & Fielding, first	$1 00
Best plate Indiana Favorite—R. L. Beck, Connersville, second	75
Best plate Indiana Favorite—Walter S. Ratliff, third	50
Best plate Jonathan—Reed & Fielding, first	1 00
Best plate Jonathan—W. B. Flick, second	75
Best plate King—Reed & Fielding, first	1 00
Best plate Lady Finger—W. B. Flick, first	1 00
Best plate Lawver—Chas. N. Lindley, first	1 00
Best plate Lawver—Chas. N. Lindley, second	75
Best plate Mann—Reed & Fielding, first	1 00
Best plate Mann—Chris King, second	75
Best plate Mann—R. L. Beck, third	50
Best plate Missouri Pippin—Samuel A. Hazelett, first	1 00
Best plate Missouri Pippin—Frank Moffett, second	75
Best plate Missouri Pippin—H. J. Hale, third	50
Best plate Moore's Sweet—Frank Moffett, first	1 00
Best plate Peck—Reed & Fielding, first	1 00
Best plate Pewaukee—Reed & Fielding, first	1 00
Best plate Ralls' Genet—Samuel A. Hazelett, first	1 00
Best plate Ralls' Genet—C. N. Lindley, second	75
Best plate Rhode Island Greening—Reed & Fielding, first	1 00
Best plate Rome Beauty—J. F. Coffin, first	1 00
Best plate Rome Beauty—C. N. Lindley, second	75
Best plate Rome Beauty—R. L. Beck, third	50
Best plate St. Lawrence—W. B. Flick, first	1 00
Best plate Salome—Walter S. Ratliff, first	1 00
Best plate Salome—Samuel A. Hazelett, second	75
Best plate Stark—Reed & Fielding, first	1 00
Best plate Stark—Walter S. Ratliff, second	75
Best plate Stark—C. N. Lindley, third	50
Best plate Roman Stem—Walter S. Ratliff, first	1 00
Best plate Roman Stem—C. N. Lindley, second	75
Best plate Roman Stem—Walter S. Ratliff, third	50
Best plate Tolman—Samuel A. Hazelett, first	1 00
Best plate Northern Spy—Reed & Fielding, first	1 00
Best plate Vandevere—Reed & Fielding, first	1 00
Best plate Wagener—Walter S. Ratliff, first	1 00
Best plate Wealthy—Chris King, first	1 00
Best plate Westfield—Reed & Fielding, first	1 00
Best plate White Pippin—Reed & Fielding, first	1 00
Best plate White Pippin—C. N. Lindley, second	75
Best plate White Pippin—R. L. Beck, third	50

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Best plate Willow Twig—C. N. Lindley, first	$1 00
Best plate Willow Twig—C. N. Lindley, second	75
Best plate Willow Twig—W. B. Flick, third	50
Best plate Winesap—Chris King, first	1 00
Best plate Winesap—C. N. Lindley, second	75
Best plate Winesap—Reed & Fielding, third	50
Best plate Yellow Bellflower—Reed & Fielding, first	1 00
Best plate Yellow Bellflower—C. N. Lindley, second	75
Best plate Yellow Transparent—Samuel A. Hazelett, first	1 00
Best plate York Imperial—Walter S. Ratliff, first	1 00
Best plate York Imperial—Samuel A. Hazelett, second	75
Best plate York Imperial—John Tilson, third	50
Best plate most beautiful apples—C. N. Lindley, first	1 00
Best plate most beautiful apples—Reed & Fielding, second	75
Best plate Spitzenburg—W. B. Flick, first	1 00
Best plate Smith Cider—R. L. Beck, first	1 00
Best plate Smith Cider—Eddie Eickhoff, Wanamaker, second	75
Best plate Tetofsky—H. J. Hale, first	1 00
Best plate Angouleme pears—W. B. Flick, first	75
Best plate Garber pears—W. F. DeVilbiss, first	75
Best plate Kiefer pears—Chris King, first	75
Best plate Kiefer pears—Chris King, second	50
Best plate Kiefer pears—J. J. Milhous, third	25
Best plate Winter Nellis—J. F. Coffin, first	75
Best plate peaches—W. B. Flick, first	75
Best plate peaches—W. B. Flick, second	50
Best plate pawpaws—James A. Little, Cartersburg, first	75
Best plate pawpaws—James A. Little, Cartersburg, second	50
Best plate Orange quinces—W. B. Flick, first	75
Best plate Orange quinces—Ed. A. Eickhoff, second	50
Best plate Champion quinces—Chris King, first	75
Best plate Champion quinces—Chris King, second	50
Best plate Missouri Mammoth—O. M. Eastes, Castleton	75
Best collection persimmons—Jas. A. Little, Cartersburg, first	2 00
Best collection persimmons—Jas. A. Little, Cartersburg, second	1 00
Best collection nuts—Jas. A. Little, Cartersburg, first	2 00
Best collection nuts—Jas. A. Little, Cartersburg, second	1 00
Best peck Irish potatoes—Jno. W. Apple, Oaklandon, first	75
Best peck Irish potatoes—J. J. Milhous, Valley Mills, second	50
Best peck sweet potatoes—David F. Copeland, Bridgeport, first	75
Best peck sweet potatoes—David F. Copeland, Bridgeport, second	50
Best collection garden vegetables—Evan B. Davis, Danville, first	3 00

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Best collection garden vegetables—J. J. Milhous, Valley Mills, second	$2 00
Best round bouquet—Mary J. Flick, Lawrence, first	1 00
Best round bouquet—Samuel A. Hazelett, second	75
Best flat bouquet—Mary J. Flick, first	1 00

Respectfully submitted,

H. M. STOUT,
W. C. REED,
JAMES TROOP,
Committee on Awards.

December 7, 1906.

Sylvester Johnson: I move you, Mr. President, that this report be accepted and concurred in.

A Member: I second the motion.

(Voted on and carried.)

President Stevens: We will hear the report of the Committee on Resolutions.

C. M. Hobbs: Ladies and Gentlemen—Your committee submits the following report:

Whereas, Since our last annual meeting death has removed from active membership two prominent, useful and honored members of our society, namely, D. H. Goble, of Greenfield, and Snead Thomas, of Marion; and,

Whereas, As each of these were active members of the society and did much to further the horticultural interests of the State in their words and work, it is fitting and proper that due notice be taken by this society in remembrance of their service as members and coworkers: therefore, be it

Resolved, That the Secretary be instructed to prepare and incorporate in our proceedings for this year a notice of their lives and their services as members of the society.

Resolved, That we recognize that the present appropriation for carrying on the work of the State Entomologist is very inadequate for enforcing the present laws in regard to controlling the introduction and the suppression of dangerous insects and fungus diseases affecting the agricultural and horticultural interests of the State, and that we ask the next General Assembly to make a sufficient appropriation to enable the entomologist to make the law effective, as it is only by constant, systematic and concerted effort that we can hope to control these

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pests, thereby saving thousands of dollars annually to the agricultural and horticultural interests of the State.

J. M. SNODGRASS,
WALTER S. SMITH.
C. M. HOBBS.
Committee on Resolutions.

Secretary Flick: I move that the report be adopted.

Mr. Zion: I second the motion.

(Voted on and carried.)

Mr. Hobbs: I would like to introduce this. There is the serious question before us in regard to how best spend the increased appropriation that we have just received from the State, and I think it is the duty of this society, and especially the Executive Committee, to give some expression as to how this money should be spent so as to produce the most good to the greatest number of people throughout the State. I have a plan in mind which I have thought a great deal about and it seems entirely practical. Now, I would like to present it for your consideration, and if you have something better let's have it.

I have thought that possibly we could spend some of this money most profitably, perhaps, by giving some practical orchard work. We would want a practical orchardist, successful in his line, to visit regions where special lines were going on, and advertise when he would be at these places and have the people who are interested in this line of work come and get demonstrations of pruning in the proper season, and of spraying in the proper season, and how to cultivate in the proper season, and give practical hints on all lines. Now, it seems to me that this would be immensely practical, and I know of no other way of reaching the people so effectively. If anyone can present some better scheme than this without discussion—we would not have time to discuss it—I am sure the Executive Board would be glad to have the information.

President Stevens: I think this matter is practically in the hands of the Executive Board, and anyone who has a suggestion as to how we can use this money best may file whatever requests they have to make with this committee.

Rev. Smith: We had a committee considering this question, and we concluded not to offer our resolution, but Mr. Snodgrass has it if you would like to hear it.

President Stevens: It should be given to the Executive Committee. We are now ready for the report of the Auditing Committee.

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REPORT OF THE AUDITING COMMITTEE.

We, the Auditing Committee on the reports of the Secretary and the Treasurer of this Society, having carefully examined the reports and accounts of these officers for this year, do report to you that we find them accurate and correspond in amounts and balances in all respects except that the Treasurer reports in his balance, unexpended, both the amount collected from members, fees and the unexpended portion of the State appropriation as one sum, while the Secretary reports simply the unexpended portion of the State appropriation.

We, the committee, recommend that for the good of the society these two accounts be kept separately, as in the Secretary's report.

R. A. TROTH.
H. H. SWAIM.
C. N. LINDLEY.
Committee.

Mr. Sylvester Johnson: I was not here yesterday to hear the treasurer's report, but I do not like the report today. I see no reason why the report should be separated. The money that is in the treasury, whether much or little, should revert back to the State.

President Stevens: What will you do with the report of the committee?

Secretary Flick: This matter of keeping the two funds separate was talked over pretty thoroughly at the meeting held State Fair week by the Executive Committee, and it seemed wise to separate the two funds, so that the fees and dues which belong to the society and no part of the State fund, would not be turned back into the State treasury if not expended. That doesn't belong to the State fund at all, and we are keeping this as a sinking fund which we can use at any time in some wise and beneficial way, therefore the committee thought best for the funds to be kept separate and apart from each other. That is the only difference in the reports. The same amount of funds have been received. It is in conformity with the law. We can handle our own fund as we please.

Treasurer Custer: For this matter it would be easy to keep the accounts separate and the membership fees can be kept under the head of reserve fund, or something of that kind, and the auditor would not require a compliance with the law in this respect like that with the State funds.

President Stevens: As the Executive Committee have taken this under consideration I think it will be well for them to regulate it as

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they think best for the best interests of the society. We find that these accounts correspond exactly.

J. C. Grossman: I move that the report be received.

(Seconded, voted on and carried.)

President Stevens: We are now ready for the report of the Committee on President's Address.

Mr. Shoemaker: We, your Committee on the President's Address, beg leave to submit the following:

First. That we endorse the icing features of the rate bill prepared by the Refrigerator Car Lines Committee of the National League of Commission Merchants, and recommend that they be incorporated in whatever rate bill which may ultimately pass Congress.

Second. That we commend the suggestion that a reward be offered for the production of a new apple, and recommend that the State Board of Horticulture take the matter under consideration.

Third. That we commend the suggestion in regard to school gardens.

Respectfully submitted,

A. W. SHOEMAKER,
J. C. GROSSMAN,
E. Y. TEAS.

(Icing Clause as acted upon by Society.)

ICING CLAUSE.

Sec. 5. That a rate to provide for the furnishing of ice for the preservation of property, requiring ice for its preservation when in transit, shall be set forth in the published tariff of the carrier under the heading "Icing Rate," and the said rate shall state the actual cost to the carrier of ice per ton placed in the car bunkers at the various initial and re-icing points where ice is furnished or required, and that the said actual cost shall be the rate.

Sec. 6. That it shall be the duty of the carrier to place upon its freight bills the several quantities of ice furnished (if any) at the several icing points with cost as per rate, carrying the same to a column of totals.

Sec. 7. That where delay occurs to a car or cars under refrigeration while in transit, and where such delay necessitates the furnishing of additional ice for preservation of contents, it shall in such case be obligatory upon the part of the carrier to furnish said ice, and the cost thereof shall be borne by the carrier.

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Sec. 8. That where the rate has been made with the view of carrying commodities under refrigeration without additional charge for such refrigeration (as in the case particularly of dairy products) Sections 5 and 6 of this act shall not apply.

Sec. 9. That if in publishing its icing rate a carrier shall publish a rate for icing other than the actual cost to the carrier of ice per ton, placed in the car bunkers, or shall charge upon its freight bills other than the actual quantity placed in the bunkers, or if a carrier shall by any secret arrangement, understanding or otherwise, either directly or indirectly, enter into collusion with any party or parties whereby a fictitious price can be or is put upon the cost of ice furnished for refrigeration of its own or cars of other carriers, the said carrier shall, for each and every such offense, be fined five thousand dollars ($5,000.00), and five hundred dollars ($500.00) for each day of the continuance of such offense.

President Stevens: We are now ready to take up the regular program. The first thing is "A Hoosier in the Ozark Region," by J. A. Burton. I believe his son is here, and will read it for him.

A HOOSIER IN THE OZARKS.

BY J. A. BURTON.

The much traveled man has always been an object of interest. One of our neighbor boys once went down to Vincennes. On his return home he related to his brother some of the wonders of his travel—"whole rows of brick houses on both sides of the road." His brother acknowledged that Frank had surely seen wonders. The greatest interest to traveling is with the traveler himself. He feels that the whole world knows he is traveling and is anxious to know about the wonders he has and is seeing. I am aware that in some respects I am different from other mortals, but in this, the same. Therefore, please be patient while I tell my story.

The first item of interest was the meeting of the American Pomological Society in Kansas City. I had never met with this august body. To introduce me the secretary placed me on the program. Of course it was not thought wise to let a novice have access to the whole field, so my paper was limited to "Cultivation of Orchards in Southern Indiana." Knowing that my method was not the one approved by the agricultural colleges, and that I was known to few of the Westerners, I reinforced my paper with a basket of Grimes, Jonathan, Rome Beauty,

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Pewaukee and Winesap Apples. When I had finished reading, the president held up my apples, unlike others present, to the excited audience; there was great confusion. Nearly everybody was on his feet wanting to ask a question. The famous gavel, loaned by the Missouri Horticultural Society for the occasion, received many hard jolts before the president could be heard to announce it was dinner time and we would take this subject up later. Then there was a rush to see and handle the Southern Indiana apples. Mr. Irwin of the Western Fruit Grower wanted the paper. Professor Beach of the Nebraska Agricultural College wanted the apples for illustration before his classes.

Much information was given out at this meeting. Some of it seemed strange and hard to understand. I learned that Minnesota was far advanced in horticulture, in fact ahead of all sections. That Iowa was a wonder along this line—much ahead of other States. That no other State was the equal of Nebraska for her fine and reliable crops of fruit. Kansas was the special State in which horticulture had outstripped its possibilities and set the other States in the shade. As for Missouri, it was utter folly for any other State to hint that they could in the least compare with her. Arkansas was simply a fruit garden, the like of which the world knew nothing. New York don't say much, but looks with contempt on other localities claiming they can raise fruit. Texas was bigger than anybody else, and as soon as she gets her pants on the rest of us had as well quit. New Mexico capped them all. She proved beyond doubt that it indicated insanity to attempt to raise fruit outside her borders.

How all these States can be so far ahead of one another is a mystery. The society never let on—did not even appoint a committee to try to reconcile the matter. Indiana was not given an opportunity to blow her horn, but her apples were there, and through them she just "looked the queen."

Professor Coburn of Kansas explained a new method of top-grafting. I consider this information worth the price of my attendance. I hope to make it very useful in the Experimental Orchard. I can't explain it very well on paper, but the graft is inserted in a long-sawed and trimmed slit instead of a split. The graft is driven in very tight. Can be used in grafting limbs from three-quarters of an inch up to any size. He stated that in inserting many thousands he had never lost one except where he broke them off hauling out the brush.

We were given a five days' excursion in Pullman cars through the Ozarks. Of nights our cars were attached to regular trains and we made our long runs. During the day we had our own train and stopped wherever interest demanded. The citizens met us with carriages

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and drove about through the orchards. On returning to the stations we were bountifully served with highly prepared meals. Then usually followed an hour of congratulatory speechmaking. The hospitality of the people seemed to know not where to end.

The Ozarks are generally an elevated plateau 1,200 to 1,400 feet above the sea. It is not nearly so hilly as southern Indiana. A great deal of it is covered with small rocks, from three pounds down to gravel. In many places these are so abundant as to amount to a mulch. Mr. Goodman informed me that where removed the fruit trees did not thrive so well. Some of this land is inclined to be wet. The fruit growers seemed to disregard this. They also seemed to pay no attention to the lay of the land, planting as readily in the valley as on the hilltop. If the orchard did poorly they attributed the failure to the weather. They have a mania for planting fruit trees, but not much heart for caring for them. Very few of them prune, spray or cultivate. Most of the spraying done is by the dust method. The enemies of fruit growing are not yet so abundant as in Indiana, but they are getting there, and unless the growers adopt better methods their business must sharply decline.

This region is undoubtedly naturally suited to fruit growing. The soil is not rich. There is probably an abundance of potash and phosphoric acid, but the nitrogen is lacking. On this account the trees never attain much size. On this account, too, and the lack of spraying, the leaves drop prematurely. This season many of them were blooming again, thus cutting off largely the chances of a crop next year. They had but few apples this year, and have not had a fair crop since 1902. Their fruit colors well, due in part to the lack of nitrogen. Poor land and small growth always produces high-colored fruit. High-colored fruit is generally of good quality. Their apples are nearly all Ben Davis and they believe them to be of high quality. Fully one-half the land is planted to apples or peaches. Why so many there and so few in Indiana plant orchards is a mystery. When they have a full crop, the yield is not large, because the trees are so small.

The Olden orchard in Missouri is one of the most noted. The trees are now about 20 years old and dying of old age. They are about the size of Indiana trees just beginning to bear. In 1902, their banner apple year, Benton County, Arkansas, shipped a carload for every 2,365 bearing trees. This seems a very small turnout, but it undoubtedly is more than Indiana shipped from that many trees. But apple growing is their principal business, while in Indiana it is scarcely a side issue. I neither saw nor heard of anything approaching the yield of the orchard of the Burton Fruit Company. With proper cultivating, fertilizing and spray-

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ing, they can surely raise fine apples, but not so large nor so many of them as we can in Indiana, but better colored. They are not so favorably located for market as we, and what is much against them, they do not grow as popular apples as we do. They are joined to their idol—Ben Davis—and woe to the individual that says aught against it. Herein lies Indiana's opportunity. The kinds that do best here are the kinds that the people want. At present Indiana is the place to grow apples for profit. It is evident that they can not be grown profitably anywhere without proper attention. This can be given as readily in Indiana as anywhere. Indiana does not grow enough for herself. She can not ship in as good as she can grow. She can grow them at a profit for much less price than they sell for now.

The Missouri Experimental Orchard is a huge affair, occupying 160 acres. It is conducted somewhat on the lines of our own experimental orchard, but on a much larger scale. They spend on it over $17,000 a year. They have fine, elaborate buildings and much ornamentation. They are testing over 400 varieties of apples. Have 1,000 pedigreed seedlings, nearly all Jonathan or Ben Davis. They will surely get the apple if Jonathan and Ben Davis can make it. They are not conducting so many really important experiments as Indiana.

President Stevens: The next thing on the program is "Growing Strawberries for Market," by Ambrose Blasdell.

GROWING STRAWBERRIES FOR MARKET.

BY AMBROSE BLASDELL, BROAD RIPPLE.

Every civilized man of the present age must realize that his own individual powers within himself are not sufficient to supply his personal necessities and insure success in his life purposes. Hence he must choose some force outside of himself to assist him in reaching his goal. Man must have an ally—a hobby—to carry him through life.

The choosing of that power or force which is to determine his weal or woe is the turning point in his life. Here is the place to use thorough knowledge, keen foresight and sound judgment. If you choose the right thing your success is sure, if you choose the wrong thing, failure is equally certain.

In the agricultural and horticultural line we find great prospects before us in all directions, but the thing for the man to do is to choose

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that particular plant product which will bring him the greatest results in his particular location and surroundings.

If I tell you that strawberries pay me best six miles from the market house of Indianapolis, I am not telling you it will pay you 50 or 100 miles from that place. Yet, by actual experience in many failures and some successes, we are forced to the general conclusion that the force manifested by this little creeping plant, the strawberry, is an important power in promoting the welfare of mankind. The relation which has sprung up between man and the strawberry plant is not a mere chance. It required genius to discover this force, and the intelligent and united efforts of generations to harness this force and give it to the present generation. Thus we find, if a man would have a plant to add to his welfare, he must add his life to it. To do this we must have an understanding of the plant with which we deal. For, what man would risk his life with an engine without a knowledge of its working principles? If we cultivate a plant for profit we want to know the law of its growth as well as the commercial value of its product. We go to the market in the strawberry season and find the town full of berries. Fine large berries will bring a good price; poor berries, a very low price.

Good berries will pay. Poor berries will not pay. What must we do? The answer is, raise good ones. But we find that the expense of picking, boxing and conveying to market is very great, and leaves to the producer a very small margin, even on his good product. And, if I have only one acre of ground for berries, what must I do to get a living out of it? The answer is, make your acre produce very abundantly. The only hope of success lies in fine berries and many quarts. You must have these here in the Indianapolis market or go out of the business. You can have them if you supply the conditions. The plant will do its part, for the governing laws of plant force are as true and regular as the rising and setting of the sun. If man will plant and cultivate, God will give him the increase.

To present a few facts and principles which underlie the production of fine strawberries in abundant quantities in a little ground is the aim of this hour. I have accordingly selected a few plants to help me to illustrate these facts. I have here a virgin plant. If you examine it you will find it is composed of three distinct and essential parts—stem, roots and leaves. The stem, as you see, is very short, and is called the crown, but it is as truly the stem as the trunk of a tree is and is made of soft, woody fiber, having the same purpose as that of a tree. It is the life center of the plant. It forms the connection between roots and leaves and holds the leaves up in the air. This stem belongs to the class

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of the root-stalk or Rhizuma, and belongs underground instead of in the air like the tree. This is a wise provision for its protection, since it is too small to withstand the drought of summer, frosts of winter or the effects of hoofs and shoe heels, so it sinks itself under a slight covering of soft earth. This crown will not do to plant like a potato. The Irish potato is also a stem, but it has also the power of a seed and can send out stem roots and leaves from its own body and by its own force, but the strawberry crown has no power to grow without its roots and leaves. It is not an individual—it is only an organ of the plant. By its roots it gets its aliment from the soil, and by the leaves it gets its air supply. The roots are all thread-like and radiate in regular circles from the crown. These roots are shortlived and after each period of the plant's growth they must be renewed. This is done by adding a new joint to the top of the stem and a new whirl of roots. This calls for a new leaf bud, so that a whole new plant is formed upon the top of the old stem, and the lower part of the stem and roots are left to retire from service. This you will readily see from the old plants I have here. This new life begins after the plant has borne its fruit and taken its summer vacation. The leaves are the lungs of the plant, as all other leaves are, and belong out of the ground. They suffer in dry, hot summer weather, but are not easily affected by the frost, and under a slight cover of straw will remain green all winter.

The modes of the reproduction of the strawberry are very interesting. In this line of life it is very vigorous and persistent. Take a virgin plant in the spring and you find it loaded with fruit buds, remove the fruit buds and out of the sides of the crown will come runners. This runner grows rapidly at a respectful distance from its mother, then turns its tip down to the ground, there a node is formed. From this node will issue roots into the ground and leaves unfold to the air, the node becomes a crown, and a new life begins. The new plant is still fed by the old one, and by its own roots and leaves. Thus its life force is doubled. The new plant sends out another runner or two and the former process is repeated each time with increased life. And thus new runners and new plants will go on and on and without a hindering agent the issues of a single plant would possess the earth. Yet, this growth is readily checked by breaking off the end of the runner. When the runners are kept cut off the plant uses its force in sending out a branch from the side of the stem. This is its third mode of reproduction. With the knowledge of these facts, the other things needful in producing good berries in abundance are to fertilize your soil, select your plants, cultivate, restrict.

Little attention need be given to insect pests and other enemies so injurious to other fruits. I know of no pest that would prevent the pro-

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duction of good berries without attention in that line. It is a strange fact that beasts, fowls or insects will eat the leaves and none of them care for the fruit.

This fruit seems to have been given to mankind alone. Wherever men live from the products of the soil, strawberries will grow. All people crave them. Women will have them; men will even pay money for them, and children will actually steal them.

From the nature of this plant and the laws of its growth, we derive certain rules for planting and cultivating it. We will put these in the form of negative commandments to make them brief and impressive.

First. Do not use plants that are shipped to you with dry roots and wilted leaves.

Second. Do not stick the tips of the roots in the ground, leaving the crown and part of the roots exposed.

Third. Do not set your plants in a ridge, for the dirt will settle away from the roots.

Fourth. Do not set plants in furrows, for then the dirt will wash down and smother the heart leaves.

Fifth. Do not stick your plants down between clods.

Sixth. Do not allow weeds and grass to possess the ground in which you have planted strawberries.

Seventh. Do not allow man or beast to step on your new patch when the ground is wet enough to pack.

Eighth. Do not allow your plants to crowd each other.

Ninth. Do not send an ignorant, awkward man in your patch to hoe.

Tenth. Do not throw dirt up against the plants when cultivating.

These are ten commandments for the strawberry men. Every one of these and many more he must obey. For, if he violates one of these rules, he may as well be guilty of all, for he will fail.

President Stevens: We will now hear J. M. Cantley on another phase of this subject.

CULTURE OF THE STRAWBERRY.

BY J. M. CANTLEY, LOGANSPORT, INDIANA.

In my part of Indiana—Cass County—an ideal soil for the strawberry is a good loam with a clay sub-soil that was planted to potatoes the year previous. If possible, well manured clover should have been grown before the potato. The clover is good for the potato, and there

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is something about the potato that fixes the soil in the best possible condition for almost any crop. Now, plow deep, but not too deep, and do not plow when the ground is heavy and sad. A plow that will edge the soil rather than turn the top into the bottom I have found to be most desirable. Pulverize, and then pulverize again. A clod is a thing to be despised. It is an abomination to the husbandman and is of no use to the vegetable kingdom, its fertility being locked from every living thing. Then crush it. The harrow and drag will do this. I have seen floats used in some parts of Indiana. When you have your soil as smooth as a garden, plant two feet in the row, three rows pistilate, one row staminate. Set with a spade. This thumb and finger business has played out. You might as well drop corn by hand instead of using a planter. A boy will soon learn to give the peculiar swing to put the roots all into the hole, and the one using the spade can easily avoid the "rat hole" so objectionable. If possible plant your rows north and south. As soon as the plant is in and before the wind springs up, go over the patch with the weeder to check the escape of moisture, for capillary attraction will try to keep the surface moist, and the wind will rapidly take it up. This must be prevented, for this is just the time above all others when the plant needs an excess of moisture rather than a deficiency. To change a plant from its native moorings and transplant it, often into a foreign soil, is a fearful shock at best, and when we remember that all plants take their food in liquid form, to conserve the moisture becomes of prime importance.

This early planting insures a good stand and an early set of runners. I know some claim the later runners are stalkier, the plant better, etc. Well, then, keep them all, but get a good stand.

We all know often, yes, quite often, it is very dry through July and August, and I prefer plants to set the last of June and the forepart of July to those whipped around by the wind drawing upon the parent plant often to total exhaustion. When the row is sufficiently set, keep off the surplus runners; what you want is enough, more may be as bad or worse than not enough. It is just as reasonable to have four, five or six stalks of corn in a hill as so many plants where three should grow.

The strawberry propagates itself in two ways—by runners and by seeds. It is fair to presume that these methods are reasonably well balanced. Destroy one method, the runner, and the plant puts on greater bud growth, increases the amount of fruit to increase the number of seeds, just as the hearing of a blind man becomes more acute and takes on some of the functions of the eye. With the runners thus treated as weeds and all weeds kept down, and the entire fertility of the soil kept for the use of the plant, the foundation for an enormous yield is laid.

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When the next spring comes the prayer of the grower is, "Give us this day our daily shower," for ninety-six per cent. of the strawberry is water. He believes in watered stock and so do his customers. No one complains of the dividends on such stock, either.

Here again man can assist nature by means of a mulch put on in the fall. It has a twofold use—yes, threefold. It prevents the alternate freezing and thawing of the ground with its resultant destruction of fruit buds, it also holds the snow, freighted as it is with fertility, as seen in the wheatfield where windrowed along the fence most of all, it holds the moisture right where the roots can take it up, and they seem to blush a deeper, darker green in doing it, each vieing with the other in drinking this nectar or the gods.

Last spring I hauled several loads of strawy manure from the livery stable and ricked it up. I am almost ashamed to confess it, but straw was exceedingly difficult to get the two years before and the mulch I must have. This fall I loaded it on the manure spreader and covered the strawberries first, then wheat straw on top. You should have seen it. Never was the child of a Czar tucked away in a cozier bed; when they awake in the spring there will be food right at their mouths. Will they, like spoiled children, turn their backs on us? Not a bit of it. Nature never turns her back upon her benefactor, but showers upon him a more abundant fruitage.

A Member: What will Jack Frost do?

Mr. Cantley: I will not take the mulch off until the danger is past. I will admit that there is nothing that invites frost like manure, but it is underneath. This brings me to another matter I must speak of—the size of the berry and its sale. Everybody wants big fruit. Quality is seldom considered in the fruit market. California fruit would go begging were it otherwise. The eye makes the mouth water; the taste never. Then why spend years educating the people to what they should buy when the birth of every child refutes your argument? The little child will pick out the big red apple every time, and you will, too, not because you are getting childish, but—oh, well—just because you do.

Now, raise a big berry and you will have a market, and don't need to make one. Suppose your berries average half an inch in diameter, yield fifty bushels per acre, sell at five cents per quart and give a gross return of seventy-five dollars per acre. If by better methods you can increase the size to two-thirds of an inch—not a big berry at all—the yield is two and a half times greater, or a hundred and twenty-five bushels, and the receipts one hundred and seventy dollars. But still better methods will make the berry one inch in diameter, make the

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yield eight times greater, or four hundred bushels, and gross receipts six hundred dollars per acre.

This explains why some succeed while others fail. Besides the big berry takes the market while the man with little berries begs one, and beggary in business is as disagreeable and humiliating as beggary because of poverty.

Again, the big berry tops the market, and if it does not spring the price the tendency is that way, your grocer meets you with a smile, asks, "What will you take?" and buys with confidence.

A Member: You do not sell the large berries for the same price as the smaller ones?

Mr. Cantley: I am putting them on the same basis, as a matter of mathematics, to show that the big berry is what is wanted.

President Stevens: But as a matter of fact the big berry sells for more?

Mr. Cantley: Yes, I will treat that in a minute. The man with little berries goes from grocery to grocery, and when he does ask the market price is met with the answer, "Yes, but that is for good stock; I'll give so and so, as I will have to sell them cheap." Discouraged, the grower takes what he can get. He is out of his time, is being humiliated and has little money for his reward and no market for tomorrow's picking.

There is another matter to be considered, the cost of picking, boxing, etc., are fixed charges, let returns be what they may. We have all sold fruit as low as three and a third cents per quart when rains delayed picking and accelerated ripening. With fixed charges at two and one-third cents the margin is only one cent—and who can get rich on a penny business?—but when the wholesale price is eight and one-third cents the margin is six cents, which means a net profit of sixteen dollars per acre in one case or ninety-six dollars per acre in the other, the yield being fifty bushels an acre. But the man with better methods, better management, better berries, has a yield of two and a half to five times greater, or from forty dollars to two hundred and forty dollars net per acre, or even more. Besides, there is a silent dignity, a self-consciousness of not only having deserved success but of winning it that surely never comes to a man with poor soil, poor berries, poor methods and poor returns, and I therefore ask for more manure, more cultivation and more mulch.

Rev. Smith: I should like to ask you if you plant your berries in rows for the sake of picking them, or if you let them go all over the ground.

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Mr. Cantley: I like to have what we call a valley between them, in which the picker walks or tries to walk, but they often step on very fine berries.

Rev. Smith: I would like to ask what varieties you find profitable?

Mr. Cantley: I expect in your section I would grow different ones. I grow the Bubach, Haverland, Senator Dunlap and Sample; in fact, I have tried thirty-four different varieties, many of them to my sorrow.

Rev. Smith: Do you grow the Gandy?

Mr. Cantley: No, sir; it yields too poor for me.

A Member: Have you tried the Ruby?

Mr. Cantley: No, sir.

A Member: Do you ever follow by sowing oats?

Mr. Cantley: No, sir. The objection is that oats require an immense quantity of moisture; it is a ravenous feeder. I have never tried that, but I have used straw; I would have tried manure before had I not secured straw.

A Member: Is the Senator Dunlap a good yielder?

Mr. Cantley: Yes, sir; it may be in some places, but not for me.

A Member: Where are you from?

Mr. Cantley: One mile from the city limits. Logansport, Indiana. The best town in the State, outside of yours.

A Member: I would like to say that if this gentleman has not tried the manure and straw before he is liable to be surprised when he sees his berries in the patch in the spring. I was one time. I put some straw upon the patch with manure in it; it was coarse straw with some manure in it, for it was taken from the stable where they had used a good deal of straw, and it made a nice mulch, but in the spring the timothy grew up so thick I cut the timothy instead of picking the strawberries. There is great danger in mulching with manure. It is my experience that you had better keep it off, if it has any hay seed in it. I mulched with that kind of straw one year and it was so dry the timothy didn't get started, and I tried it again the next and lost my patch.

Mr. Theo. Wilson: I have been growing berries for thirty years, and I have found in that time that clean wheat straw, and plenty of it, can be obtained in Marion County, and if it is not clean you can clean it, and I have found that it is the best for mulching. I have had the mis-

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fortune to mulch with manure, and you are likely in that way to get another crop, for you can not find manure but what has hay seed in it, more or less, and you will ruin your patch the first year.

I have heard persons say that you can not get the ground too rich for strawberries. You can, I say, for one year I planted a patch of berries where I had been feeding hogs for a number of years, and I grew the finest plants you ever saw, but there were no berries. It was all foliage. You can have your ground too rich for strawberries.

As to raising large berries, our city consumes during our fruiting season from three to four thousand bushels of strawberries, and nine-tenths of the berries that are sold are our medium-sized berries. Why? Simply because the mass of the people who buy them have to live very economically, and they can not afford to pay fancy prices for their berries. You can sell ten bushels of the ordinary Haviland berries where you can not sell one bushel of the William Belt. I know full well that the large berries are the money-makers. I grow a good many berries. In the year 1882 I sold over a thousand bushels—nearly twelve hundred bushels—and I have to grow good berries, and I prefer the large berry for a money-maker, but the demand is large for the medium-sized berries. Nine-tenths of the people can not afford fancy berries. We have them on the North Side in flats that spend all of their money, and they do not mind paying ten and fifteen cents a quart for them, but the majority of our people want the smaller berries—not because they are better than the others, but because they can not afford to buy the fancy ones.

I want to say a word in favor of the new berry which we have here—the Oakland. But few of us have heard of it. It is the most productive one I have ever had on my farm; it has good, clean foliage, and sends out large, heavy runners; it is a good plant and the berries are fine. The William Belt is the best in the world, and you have no trouble at all to get ten cents a quart on the street. Everyone wants it. There are so many good strawberries if you know how to handle them. I sell my berries to the consumer and do not give the commission man a chance to pocket half, and steal the other half. They will not all do that, but some of them will. I had one plant last spring that I tested, and after the fruit was off I watered it occasionally, once a week probably, and it has set three hundred plants. If you can set a thousand plants from four and get three dollars for them, isn't there money in it? I sell a lot every year. There are some varieties that set too many plants and you will have to cut them out, and others do not set enough.

Mr. Walker: I would like to ask what success you have had with the Warfield, and if you find it a good market berry.

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Mr. Wilson: It is a good selling berry, and is one of the medium berries. It is of the Senator Dunlap type. We have a man in this city who grows fine ones. It is a small berry and does not have a good flavor, but some of the larger growers raise it.

Mr. Grossman: I wish to make a statement with regard to the flavor of the Senator Dunlap. It does have a good flavor. Perhaps it takes a little more sugar, but you can not find a better flavored berry, and people in the northern part of Indiana and in Michigan think it is the best ever for canning. If you get the ground in the right condition and don't get the plants too thick they are fine berries.

President Stevens: I think this is all the time we have on this subject. Are there any other committees to report, Mr. Secretary?

Secretary Flick: I have no other reports on my table. I have quite a speech somewhere, but I will not inflict it upon you at this time. I intended to set forth some of the intentions of the society, but I will do that by circular. I will prepare a circular and mail it to you.

Mr. Swaim: I have a resolution here which I would like to present—

Resolved, That we extend an invitation to the potato growers of the State through the Potato Growers' Association to unite with the State Horticultural Society, said Horticultural Society to give ample time for discussion of subjects pertaining to vegetable growing in all of its meetings.

Secretary Flick: I move that resolution be adopted.

J. W. Apple: I second the motion.

(Voted on and carried.)

President Stevens: The election of officers is next in order. I am sorry to tell you that I am called away, but in my absence I will put a better man in my place. Mr. Hobbs, will you take the chair?

Mr. Hobbs: I would prefer that the president stay with his work until it is completed, but I will do the best I can.

As I understand it, we are now ready to proceed with the election of officers by ballot. We will now hear the nominations for president. Perhaps I had better say that no one is allowed to vote who has not paid his dues.

Mr. Zion: In the absence of any other nomination, I wish to place in nomination our worthy president, Mr. W. W. Stevens.

Chairman Hobbs: I understand that he will not accept the office, as he has declined, and I see no reason why we should nominate him if he will not accept.

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Mr. Wilson: I wish to nominate Mr. C. M. Hobbs.

Chairman Hobbs: Mr. Hobbs positively declines; he is not in the race.

Mr. Shoemaker: I wish to nominate Mr. Swaim, of South Bend.

W. C. Reed: I move you that the secretary cast the entire vote of this society for Mr. Swaim.

(Seconded and carried, and secretary casts the vote.)

Chairman Hobbs: As Mr. Swaim has received the entire vote of this society for president for the coming year, I now declare him duly elected? Will you take the chair at once, Mr. Swaim?

Mr. Swaim: I would prefer that you proceed until the close of the session, Mr. Hobbs.

Chairman Hobbs: The next in order will be the election of the vice-president. Are there any nominations?

Mr. Henby: I wish to put in nomination Mr. Tilson, of Franklin, Indiana.

Professor Troop: I wish to nominate Mr. W. C. Reed.

Mr. Tilson: Mr. Reed is a fine fellow, and I am getting at an age when I am not asking for any promotion, and so I wish to decline in favor of Mr. Reed, and stop this right here. I move to have the secretary cast the vote of the society for Mr. Reed.

(Seconded, voted on and carried.)

Secretary Flick: I hereby cast the entire vote of the Horticultural Society for W. C. Reed as vice-president.

Chairman Hobbs: As W. C. Reed has received the entire vote of this society I now declare him duly elected vice-president.

Nominations are now in order for secretary. Who shall it be?

Persons all over the room: W. B. Flick.

Mr. Shoemaker: I would like to move that the entire vote of the society be cast for Mr. Flick.

(Seconded, carried, and Chairman Hobbs cast the vote of the society for Mr. Flick.)

Chairman Hobbs: The next in order is the treasurer.

Mr. Zion: I desire to put in nomination for treasurer of this association one of the most practical and successful horticulturists in Indiana. He is not an old member of this association, but he is a hard

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worker and a successful man, and attracted a great deal of attention with the fruit he had at the World's Fair, and that gentleman is Mr. Hazlett, of Greencastle, Indiana.

Mr. Teas: I wish to nominate Mr. Custer, the present incumbent.

A. W. Shoemaker: I wish to nominate Amos Garretson.

Chairman Hobbs: The nominations are now closed, and you may prepare your ballot for treasurer. There seems to be a good many applicants since we have received the increased appropriation.

I will appoint Mr. McDonald, Mr. W. C. Ratcliff as tellers.

Secretary Flick: Mr. President, we find that the result of the ballot is as follows:

Mr. Custer 23
Mr. Hazlett 21
Mr. Garretson 13

A. W. Shoemaker: As a friend of Mr. Garretson, who is not here, I wish to withdraw his name.

Chairman Hobbs: You may prepare to ballot again.

Secretary Flick: We find the result of the second ballot as follows:

Mr. Custer 25
Mr. Hazelett 30
Mr. W. C. Ratcliff..... 1

Chairman Hobbs: As Mr. Hazlett has received the majority of all the votes cast, I now declare him duly elected as treasurer of the Indiana Horticultural Society for the coming year.

Nominations are now in order for a member of the Executive Committee.

A Member: I wish to nominate Mr. W. C. Ratcliff.

A Member: I second the nomination.

Mr. Shoemaker: I nominate Mr. J. C. Grossman, of Wolcotville.

Chairman Hobbs: You may prepare your ballots on these two persons.

Secretary Flick: Mr. President, we find the result of the ballot is as follows:

Mr. W. C. Ratcliff..... 26
Mr. J. C. Grossman..... 24
Mr. Shoemaker 1

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Chairman Hobbs: As Mr. W. C. Ratcliff has received a majority of all the votes cast I declare him duly elected.

Next comes the Horticultural Committee.

(This committee stands just the same, except that Mr. R. D. Simpson was chosen for the Second District and Mr. L. B. Custer for the Eleventh District.)

Chairman Hobbs: As this concludes our business you may now consider yourselves adjourned sine die.

(The meeting stood adjourned.)

(On account of sickness Mr. Teas was unable to be present to read this paper.—Secretary.)

LANDSCAPE GARDENING.

BY EDWARD TEAS, JR., JOPLIN, MISSOURI.

A study of the principles of good taste in planting and arranging should be of great benefit to all mankind. Wonderful opportunities are open to us in the enjoyment of the beauties of the landscape if we are able to analyze and understand a landscape.

I wish to say a friendly word in behalf of gardening as an art. Not attempting to speak of all its phases or possibilities or to speak exhaustively on any of them, but to plead the cause of good taste in arrangement and planting. For today the art of gardening is practiced much more often than any of the other arts in ignorant and impulsive ways by people who do not stop to think of it as an art at all.

Wordsworth says, "Laying out grounds may be considered a liberal art in some sort like poetry and painting;" while Poe says, "The creation of a landscape garden offered to the proper muse the most magnificent opportunities. Here indeed was the fairest field for the display of the imagination in the endless combining of forms of novel beauty." Mrs. Van Rensselaer says the arts of design are usually named as three—architecture, sculpture and painting. It is the popular belief that the man who practices one of these arts is an artist; yet there is a fourth art—that of design—which will deserve to rank with them, for it demands quite as much in the way of artistic feeling, creative power and executive skill. This is the art which creates beautiful compositions on the surface of the ground. The mere statement of its purposes should show that it is truly an art. The effort to produce organic beauty makes

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a man an artist; neither the production of a merely useful organism, nor beautiful isolated detail can suffice; he must compose a beautiful whole with a number of related parts. Therefore he who raises useful crops is an agriculturist and he who grows plants for their individual charms is a horticulturist, and he who constructs roads is an engineer. The man who uses grounds, plants, roads and paths, and water and accessory buildings with an eye to organic beauty of effect, is or ought to be an artist. All the arts of design are thus akin in character and purpose.

Our art uses her materials as Nature herself uses them, and the more perfectly the artist performs his work the more likely we are to forget that he has been at work, since Nature might, under favoring conditions, have produced the result without man's aid.

Central Park, New York City, with its meadows, ponds, trees and shrubs, with woodland passages and verdurous cliffs and hollows, was forty years ago a dismal, barren, half rocky, half swampy, treeless waste, while to the ordinary observer it would appear that all man has done was to lay out roads and paths, and build terraces and bridges to make it convenient for the crowding thousands who visit it. In the naturalistic work we may carelessly admire the work, forgetting that an artist wrought it. Working in and for and with Nature we use her materials, colors and methods to simply help her in her efforts to realize her beautiful possibilities. A more or less intelligent love for natural beauty is very common with us, while good judgment in art is very rare.

The sculptor and painter observe defects in a single model, but he notes in many models scattered excellencies which he strives to reunite in his work. We can not rival Nature by producing anything exactly like her work, but we can create something which shall show what Nature strives after. The mind of man comprehends her efforts, and though his skill can not compete with hers in the production of particulars, man is able by art to anticipate her desires and to exhibit an image of what she was intending. While the landscape gardener is Nature's rival, creating things like her own, she works with him while he is reunitng her scattered excellencies and obliterating her defects. What he can not she does for him, from the building of mountains and spreading of skies to the perfecting of those particulars which turn the keenest chisel and blunt the subtlest brush; to the curling of a fern frond or the veining of a rose. Of course, she can not everywhere do everything. If part of her work is completing, man's part is in preparing for it, and he must respect the canvas and frame which she furnishes for his picture and the general scheme which she prescribes. He can not ask her to build mountains in a plain nor to make tropical trees

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grow under northern skies, but he can always persuade her to produce beauty of some sort, if he is wise enough to know for what sort he should ask.

The most potent factors in Nature's beauty are light and atmosphere, but to the landscape gardener's picture Nature freely supplies them. Not only in the phase for which the painter strives, but in a thousand, changing with each day of the year and every hour of the day. With the passing seasons she also changes her terrestrial effect, so that no part of his work is twice the same, although if rightly wrought it is always beautiful. "Nature," writes Aristotle, "has the will but not the power to realize perfection." Turn the phase the other way and it is quite as true; she has the power but not the will. In either reading, it means that man can aid and supplement her work. The landscape gardener can bend her will in many ways to his own, but he must have learned from her how to do it. He can not achieve things to which her power is unequal, but he can liberate, assist and direct her power. His clumps of trees and flowers she grows for him as cheerfully as though she herself had sown the seed. He can not make rivers, but he can make lakes from rivulets and cause water to dominate in a place she has spread with green grass. He can teach her to create exquisite details, scarcely hinted at in her unassisted products. In short, it is the landscape gardener's task to produce beautiful pictures. Nature supplies him with materials, always giving him vitality, light, atmosphere, color and details, and often lovely or imposing forms in the combination of the soil; and she will see to the finishing of his design; but the design is the main thing, and the design must be of his own conceiving. With each piece of his actual work Nature says to him, "Here in this spot I have drawn a rough outline which is for you to make into a picture. In many other spots I have shown you scattered beauties of a thousand kinds. It is for you to decide which you can bring into your work and discover how they may be fused into a whole which shall look as beautiful and as right as though I had created it myself."

Appropriateness must be the touchstone for each particular feature as well as for general effect.

The artist's memory is stored with endless beauties and combinations and good ideas of foreground, middle distances and background, and with exhaustless materials in the way of trees, shrubs and flowers, but not one of these can be used until he has considered whether it will be appropriate and practical in the scheme he is carrying out. Indeed, the true process for landscape work is more imaginative than this. The true artist will go about with a store of features and effect in his mind and strive to fit some of them into the task of the moment. He will

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conceive this general idea in deference to the local commands of Nature; develop his general scheme as artistic fitness counsels; discover the special features which are needed to complete it.

In educating himself, he will strive to remember less definitely this and that particular result than to understand how Nature goes to work to produce beautiful results. He should try to permeate himself with her spirit to comprehend her aims, to learn by harmonious contrasts, by fitness of feature and detail, by beauty of line and color and by distinctness of expression. He should train his memory for general rather than particular truths, and chiefly to purify his tastes and stimulate his imagination, for he will know that while in some ways he is Nature's favorite pupil, in others she treats him more parsimoniously than the rest. She gives him an abundance of models, by the study of which he may make himself an artist, but when he is at work she will never give him a pattern which, part by part, can guide his efforts.

The smallest cabin in the clearing requires at least a pathway leading to it, and to do as much as make a path in the most pleasing way requires a certain amount of imagination—of art. How much more then is the imagination needed in the laying out of a great estate, where subordinate buildings must be grouped around the chief one, and all must be accommodated to the unalterable main natural features of the scene; where a hundred minor natural features must be harmoniously disposed, where convenient courses for feet and wheels must be provided; where gardens and orchards must be supplied, where water must be made at once useful and ornamental, and every plant, whether large or small, must be beautiful in the sense of helping the beauty of the general effect. The stronger the desire to make so artificial a composition look as though Nature might have designed it, the more intimate must be the artist's sympathy with her aims and processes and the keener his eye for the special opportunities of the site she offers, but also the greater must be his imaginative power, the finer his grasp on the principles and processes of art.

Mrs. Van Rensselaer continues to say, "If now we ask when and where we need the fine arts of gardening, must not the answer be, whenever and wherever we touch the surface of the ground and the plants it bears, with a wish to produce an organized result that shall please the eye?"

"Grouping," says Wideman, "we believe to be the most delicate if not the most difficult subject, to be treated in such a manner as to lead to a tasteful and proper conception of it. No rule can be established, for the combination of various kinds of trees in one group should never be imitated on the same ground. No one can ever be a landscape archi-

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tect who does not possess tasteful originality, and an eye for the beautiful harmony of lines and colors. Before one plants his trees, it would be well for him to visit such places as are acknowledged schools of taste, of which Central Park is the chief. There the various groupings may be studied, and the reasons why they occupy just such a place be reflected upon. The general forms and outlines for the groups produce different effects, and tints and colors require particular consideration. In the several seasons each group experienced a change either slight or more striking, and the changes constantly produced were in harmony with the various surrounding groups. Observation would teach that there was a particular place for each group, and the plants for it are selected with the groups they compose, and with the groups that surround it. Groups vary in size, according to the size of the place and the effect required, remembering that lawns are all important, and they should not be sacrificed. If there are too many trees, they will destroy the beauty of a landscape—that is, its lightness and freedom."

Groups of shrubs may properly be placed in curves of roads and walks so as to give a natural effect. The nearest tree to the road should usually be from ten to twenty feet from it, so that when grown it will hang down over the margin of the lawn. Shrubbery is planted not nearer than three feet. On the principal lawn, these groups are composed of choice trees and shrubs. Groups consist of evergreens mingled with deciduous shrubs and trees, or deciduous trees and shrubs, or of shrubs alone, according to the effect desired to be produced. Elevated portions of the land often afford fine sites for a group, which seems to greatly raise the place and consequently give a more undulating appearance to the land. On both sides of the entrance groups are made, both to hide the entrance from within the grounds, and form a pleasing background, as well as to give prominence to the entrance from the outside. Groups are also placed to form backgrounds for trees, flower beds, statues and vases. Groups are planted to separate the ornamental grounds from the orchard and vegetable garden and outbuildings. Grouping in extensive grounds is carried to the extent of making thickets or mass grouping. Dells or low sections ought to be filled up with planting, but the beautiful sweep of the green turf should be left free to receive the lights and shadows. Grouping immediately around the house should not be done, neither should the house be left destitute of trees. While lawns are large, single specimens of trees should be planted here and there. Where several trees or groups are planted, their relation to the lawn and road should differ in order to avoid all appearance of regularity. A similar group of trees should not be placed on each side of the house, nor should there be any similar attempt upon the grounds.

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Constant variation should be sought and at the same time the creation of absurdities avoided. Groups are not to be planted indiscriminately, but a good reason ought to be had for the disposition of every group and every tree, either for its beautifying effect or for its usefulness and beauty combined, and there should not be a stronger reason against the planting than there is for it, for a group, attractive in itself, may be placed in such a position as to greatly mar the aspect of the whole principal ground, which would be a gross error.

The size of groups depends upon the extent of the grounds. This is applied to the grounds as a whole; taken individually, their size or extent should be in proportion to the curve, point or hillock on which they are planted, or according to the background, cover or shelter required. The size of groups is regulated according to their combination. The needful subject for consideration is their form. Worchester says grouping is "the art of combining objects with a view to picturesque effect." This has especial reference to the group plan or disposition in planting. In planting small groups do not allow any great variation in their horizontal outlines, but larger ones afford all the opportunity necessary for bays and recesses, with gradual or bold projections. We also have to give much attention to the vertical or top outline, which depends upon the shape and height of trees and shrubs. The rule concerning these is that the tallest is placed in the center, then come the trees of medium size, and the smallest are placed on the margin. If groups are placed so that only one place can be seen, the largest trees or shrubs are planted in the rear. The exterior shrubs should not all be of the same height, but be so placed that their top line will present a proper amount of variation. Trees or shrubs are often grouped by arranging them according to their foliage, making a group of small-leaved trees, a group of those with cut leaves, another with pinnated foliage; but in every case color and size must be considered as equally important. Plant at unequal distances and not in line. This principle should be carried out in all grouping, whether in small or mass planting. Landscape architecture is no less difficult than painting, colors are living and changing. It is necessary to be familiar with them or the landscape may be dull and lifeless. The art is to produce the beautiful and picturesque by unity, variety and harmony.

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MEETING STATE BOARD OF HORTICULTURE.

INDIANAPOLIS, IND., Dec. 7, 1905.

Immediately upon the adjournment of the forty-fifth annual meeting, the State Board of Horticulture convened in Room 12, State House, and proceeded to business as follows:

Mr. J. V. Simpson, of Vincennes, Indiana, was chosen as a member of the Advisory Board on the Experimental Orchard, to serve three years, in place of Mrs. W. W. Stevens, whose time has expired and who refused to stand for re-election.

The Noble County Horticultural Society tendered by letter an invitation to the Indiana Horticultural Society to hold its summer meeting with them at Rome City, Indiana.

On motion the invitation was accepted and the secretary was instructed to correspond with them to ascertain agreeable dates and other matters.

The following bills were filed and allowed:

Prof. W. J. Green, Wooster, Ohio, expenses and services	$30 00
E. Y. Teas, expenses as member Executive Committee	6 75
Prof. L. R. Taft, Agricultural College, Michigan, expenses and services	25 00
H. M. Stout, expenses as expert judge	4 15
Prof. James Troop, expenses as member Executive Committee	9 80
W. C. Reed, expenses as member Horticultural Committee	10 00
John Tilson, expenses as member Horticultural Committee	2 50
H. H. Swaim, expenses as Vice-President	12 00
J. C. Grossman, expenses as member Horticultural Committee	15 50
Wm. M. Waltman, expenses for services on program	2 00
John Tilson, expenses as member Legislative Committee	5 00
G. D. Dickson, salary, November	40 00
W. W. Stevens, expenses as President	15 00
J. J. Milhous, expenses as member Horticultural Committee	85
Walter S. Ratliff, expenses as member Executive Committee	9 75
J. M. Snodgrass, expenses as member Horticultural Committee	3 50
C. W. Foote, expenses as member Horticultural Committee	11 00
C. N. Lindley, expenses as member Horticultural Committee	13 10
Jos. A. Burton, expenses as Supt. Experimental Orchard	10 00
R. A. Troth, services at annual meeting	7 95
A. W. Shoemaker, expenses as member Horticultural Committee	2 00
L. B. Custer, premiums paid at annual 1906 meeting	121 25

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L. B. Custer, expenses as Treasurer..... 11 50
J. M. Zion, expenses as member Legislative Committee and fruit furnished 16 75
J. M. Cantley, expenses for services on program..... 3 40
Ella S. Green, services as stenographer..... 44 00

REPORT FROM WAYNE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

To the Indiana Horticultural Society:

I herewith submit this, my annual report, to your honorable body of the Wayne County Agricultural and Horticultural Society for the present year with a resume of the agricultural and horticultural conditions for this section of the State.

This society being one of the oldest in Indiana, still holds its regular sessions, and was organized under the name of the Richmond Horticultural Society in the year 1856, in Richmond.

Although the society has permanent quarters for holding its meetings in the County Court House, yet the summer and autumn sessions are usually held at private residences or at some of the public parks that are found in different parts of Wayne County. At such gatherings well-filled baskets are usually taken, and the members and their friends spend the day socially and in comparison and consideration of the products of the garden, orchard and field that are to be found on the exhibition tables, grown by the members of the society.

The most interesting if not the most enjoyable meeting of the year is the annual feast held in February. Premium lists are previously issued to the members, and the ladies very naturally endeavor to produce the viands that will most likely be the winning exhibits in the awards that are made by special committees appointed by the chief executive for that purpose. These culinary products after the awards are made are placed on the dining tables and the members with their invited guests partake of the annual feast.

At the several sessions, aside from committee reports, examination of exhibits, communications, etc., an address is given. These addresses are by men and women of ability, treating of subjects that interest the members of the public generally, such as literature, science, history, forestry, religion, agriculture, dairying, pomology, etc. A synopsis of these, together with the minutes of the society, are submitted for publication to our city newspapers.

The present officers of the society are: President, Oliver Burgess;

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vice-president, Stephen Kuth; secretary, Walter S. Ratliff; treasurer, T. E. Kenworthy, and corresponding secretary, Wallace C. Reynolds.

Agriculture.—For many years the farmers in this section have not been so well blessed with such bountiful crops and continued successes in their favorite avocation. From the opening of spring to the beginning of winter the husbandman has been favored on every hand, so that their larders are now well filled with the shekels of wealth and their bins brim with their harvested crops of grain.

Corn.—One of the largest acreages in years, and with an exceptional yield, an enormous crop has been grown and gathered in fine condition. The bulk being stored for future feeding, as farmers are retaining their surplus stock for late winter and spring markets.

Wheat.—Although the yield of wheat ranged near twenty bushels to the acre, yet but very few farmers had any wheat harvest, owing to the small acreage sown last autumn. The present growing wheat looks fairly well and enters the winter in good condition. The fly and rust have been bad on the earlier sown fields.

Oats.—An excellent crop of straw and grain, which was cut with some difficulty owing to its tangled condition at harvest time. The frequent heavy rains interfered with threshing, so that much of both grain and straw was lost through mold and sprouting in the shock. The damaged grain had a depressing effect on the markets following.

Barley.—But little grown, yet the yield was a fair average. The joint worm and meromyza were quite serious pests at heading time.

Hay.—Although prospects for timothy were flattering early for an abundant yield, yet the season appeared too wet and the growth of the meadows was not heavy. Clover, however, yielded immensely, and saved in fairly good condition. But that cut for seed proved a failure, as whole areas of clover died soon after, and no seed formed, due doubtless to the root-borer.

Alfalfa.—The showery condition of the weather at cutting times rendered saving of this new hay uncertain, and much of it was left on the fields to rot. The craze for alfalfa growing has somewhat subsided, after farmers have had an opportunity to ascertain its value as a crop and feed.

Live Stock.—Hog cholera has seriously depleted the herds of swine in various parts of the county, but with the approach of winter its ravages are lessening. Cattle feeding and dairying continue as important factors, and with the failure of the creameries more individual family butter will be offered on our markets.

Vegetables.—With the most favorable conditions, the vegetable gardener has had one of the most prosperous years. With a seasonable

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spring and summer, followed by a late autumn, gave opportunities for the growth of the products of the garden. The exception being with early potatoes in some localities.

Fruits.—Although there were flattering prospects by a profusion of bloom and the healthy condition of fruit stems and branches in the spring, yet the average fruit man has not been pleased with the yield of his plantations and orchards. The ravages of insects made possible by the frequent copious rains interfering with the spraying with poisonous solutions is attributed as largely responsible for the failure in setting and ripening of fruits.

Apples.—But few of our fruit men had enough of apples to supply their own wants. The summer and early autumn varieties did best, while but few winter sorts were saved for later keeping. The Wealthy, Grimes Golden, Roman Stem, Red Astrakan and Rome Beauty were among the best fruited of any varieties.

Pears.—Although many pear trees last year suffered from limb blight, yet but few trees were entirely lost. The fruit grown this year was of excellent flavor, good size and of a bright color, but the yield was very light, and some varieties matured but few specimens. The Seckel and Clapp's Favorite did fairly well, while the Kiefer was alone in a large yield of magnificent fruit, which is now being enjoyed as the only excellent fruit of the winter.

Plums.—Contrary to expectations, but few plums were grown. The bloom was profuse, the set of fruit satisfactory, but the wet weather and insects combined against their maturity, and scarcely a variety ripened enough of plums to test its good qualities.

Peaches.—Seedling and cultivated varieties alike yielded a fair crop of peaches, and most farmers who had trees of bearing age were pleased to be able to gather their own home-grown supply of this luscious fruit.

Crabapples.—The consumption of this kind of fruit not being large, the medium-sized yield seemed ample to supply the trade. Later planting of these trees, however, embrace some of the later and newer varieties, which may act as an incentive for increased consumption in the future.

Cherries.—Unfortunately, of the fine set of fruit on branches, only about one-half of the crop matured. The late spring freezes, together with the troublesome worms and birds, account largely for the partial failure. Later varieties proved the best bearers this season.

Quinces.—A very scattering yield, but as the fad of making quince preserves, butter and honey in small quantities is lessening, the scarcity of this fruit was not much noticed.

Grapes.—Apparently everybody had all the grapes they could use,

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some even put up numerous bottles of grape "juice." If the berry worm could be checked in its ravages, more fine, compact bunches could be grown and a greater assortment of varieties would be set by our members.

Strawberries.—But half a crop was gathered, and they not equal in size to former years. Late spring frosts and too frequent showers later are perhaps the causes for such losses.

Raspberries and Blackberries.—From the uncertainty in fruiting of these berry canes, our fruit men have largely neglected their cultivation, and with the light yield this year the general public was not much inconvenienced.

Gooseberries and Currants.—Not very extensive growers of these are to be found in this locality, but the supply is far inadequate, and there is need of additional planting of these bushes.

Ornithology.—There seems to be a diversity of opinion among our fruit men relative to the protection of our native birds. Realizing the benefits derived from the destruction by them of insects injurious to grain and grasses, yet some of our members feel that this does not compensate for the loss of ripe cherries and plums by the flicker, red-head, catbird and robin, of apples and grapes by the sparrows, and of ripe strawberries by the orioles.

One means employed to offset such depredations is to plant Russian mulberries promiscuously about the lawn and orchards, to afford fruit for the birds, appeasing to a certain extent their appetites for the fruits we wish to protect.

Entomology.—By the installation of an insectary under the direction of the United States Department of Agriculture on a farm of one of the members of the society adjoining the city of Richmond, it has increased the interest in the subject of entomology and has given the members and others an opportunity of practically observing the workings of the same, and becoming more familiar with the habitat of our more common insect enemies as well as learning something of the character and depredations of newer enemies to agricultural products, such as grains and grasses.

Although in its infancy, yet from the progress made within the past year much is expected to be accomplished, and with the systematic line of investigation undertaken, there seems to be but little doubt but that the desired intentions will be attained.

WALTER S. RATLIFF, Secretary.

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LAGRANGE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

Yearly Report for the Year Ending December 31, 1905.

The society has had one of the most successful years of its history. Many new families have been added to its membership, so we number between 200 and 300 members. The society has taken advantage of one of the free scholarships offered to the society by Purdue and has sent Levi Schermerhorn to the university for the winter course. The society has sent J. C. Grossman, Lagrange, as delegate to the State Board of Agriculture; Leroy Eshelman, Lagrange, to the summer meeting at Henryville, and Misses Frank Chegston, Wolcotville, and Lewis Deal, Lagrange, to the State Horticultural Society at Indianapolis, December 6-7, 1905.

Have held six regular meetings and made creditable displays at five and paid premiums on the same. The society is getting out 3,000 year books for 1906.

The officers for 1906 are: J. C. Grossman, R. F. D., Wolcotville, Ind., president; J. W. Mills, R. F. D. No. 7, Lagrange, Ind., vice-president; Mrs. A. H. Bogue, Lima, Ind., secretary; Miss Myrtle Vankirk, R. F. D., Lagrange, treasurer; Messrs. Leroy Eshelman, R. F. D., Lagrange; C. C. Smith, R. F. D., Lima, and D. B. Schaeffer, R. F. D., Lima, Executive Board.

MRS. LIZZIE C. ROYER, Secretary.

REPORT FROM FOURTH DISTRICT.

According to letter received from the secretary, I make a report for the Fourth District, following instructions of letter.

General Conditions.—The advancement in horticulture in my own county (Johnson) in the last few years can readily be seen. More farmers are planting new orchards, are buying sprayers and taking care of old ones; more fruit gardens are being planted each year, mostly strawberries. Nearly every farmer in this locality has a strawberry bed and are learning to take care of them. There are ten strawberry beds now to one a few years ago.

Commercial Orchards.—In the north part of Johnson County Dean & Billingsley have planted large commercial orchards and nurseries, while south of here, in Brown County, there are several large commercial orchards. I am not well enough acquainted in that locality to give names of all growers nor number of acres nor kind of fruit, what success financially, etc., but I promise you that next year I will go down

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in Brown County and stay long enough and report you next year. I think that locality is destined to be one of the best fruit sections of the State. As to what suitable fruit land can be bought for per acre, that depends on locality. In this county land can not be bought for less than $100 per acre and up, while in Brown County and south and west of there good fruit land can be bought for $10 to $20 and up.

As to any forward movement with regard to beautifying school grounds, public roads, etc.: In this county all roads are getting in splendid shape; all the main roads are graveled and at the rate we are going now all the cross roads will be graded and graveled in a few years. Each farmer donates labor in hauling gravel every fall.

Johnson County Horticultural Society is in good shape; meetings well attended; have two fruit and flower displays every year, in June and September. H. C. Lockry, president; W. S. Young, secretary. We also have a farmers' club managed by the younger farmers and their wives. This, too, is doing a good work. C. A. Dungan, president; Harry Kelly, secretary.

In regard to suggestions as to what is needed to better conditions in this district: To answer in one word, I would say, "Educate." But how to reach the masses is the question. I would suggest as one way, now, that farmers' institutes are well attended and a good interest shown, that some arrangements be made with the Purdue management so that we might have a place on the program; then send one of our practical horticulturists—one with good, common, horse sense—who could explain to farmers that by planting and caring for an orchard they could double and treble the price of their land. They will listen to you. We have first to get them to understand that they can make money, then they will plant an orchard. Next I would have prepared for publication in farm papers articles of vital interest to horticulturists. Nearly all farm papers and most of the country papers will publish articles of interest to farmers.

JOHN TILSON.

Franklin, Ind.

REPORT FROM SIXTH DISTRICT.

The Sixth, or Old Burnt District, has occupied the front rank in horticulture ever since the early settlement of the State. The orchards planted by the early pioneers have nearly entirely disappeared, but few of the trees still remaining, which have long since ceased to be productive, and many orchards since planted are fast going to decay. So one finds a difficult problem to solve in answering the question as to the present condition of horticulture throughout the district. Until the last

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few years we raised all the fruit that was used in the district and had plenty to sell, but this is no longer the case, and I have to acknowledge the disagreeable fact that owing to the large increase in the consumption of fruit we are compelled to draw on other sections for the supply, showing that the horticulturists of the district have failed to keep up with the progress made by the other branches of industry. Yet one can plainly see that the general conditions show great improvement, especially along the line of ornamental planting, as the many fine country homes surrounded by beautifully arranged and well kept grounds, the fine orchards and abundance of small fruit to supply the families of the owners, which all are conducive to their health and happiness.

There are but few farmers that have not got some excuse for an orchard and almost every family has fruit enough to do them. Some of the orchards show that the owner takes interest, and are well taken care of, while the majority of the orchards are left badly neglected. Scab on the fruit and canker worms destroying the foliage cause the enthusiasm of the owners to run to low ebb. Still we know that we can overcome both scab and insects by spraying, yet the majority of farmers do not think the fruit worth the time and ammunition it takes to save it. Perseverance, vigilance and hard work are necessary to raise fine fruit, and if one has the enthusiasm to care for his trees there is no question as to the success. There is money in fruit culture, but like any other business, it takes the man cut out for the work that succeeds in getting rich in fruit growing. There are quite a number of orchards through this section that were planted for commercial orchards, and where the right varieties were planted they have proved a paying investment. Some twenty-five years ago the writer planted some forty acres in orchard, and planted one thousand Ben Davis; the balance were Smith Cider, Baldwin, Grimes Golden, Clayton, Winesap and White Pippin; the last three varieties have not done any good. Had I planted all Ben Davis I would have a far better showing on the profit side of the ledger—even with the mistake in setting out varieties that proved not adapted to the soil and unproductive. I am ahead in the game and the orchard has proved a paying investment. While it is true that in some years like this it has proved a flat failure, as this was an off year; and if my apple trees had been peach trees this year they would have been more profitable, as wherever there was a peach tree old enough to bear it was full of fruit, notwithstanding the fact that the mercury on the 13th and 14th of February last winter marked as low as 20 degrees below zero. Years ago I planted eight hundred pear trees, of which five hundred were Bartlett. While the fruit of the Bartlett is fine, the tree is a fraud, as like some other good things the trees die young. The Flemish Beauty is the

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only variety that helped me out on the funeral-expenses, and unless the three hundred Keifer trees that I planted four years ago will redeem the loss it is a sure case that I never will get rich growing pears.

There is a great deal more ornamental planting and beautifying of school grounds done on paper than in reality, and I do not know of any successful effort. There have, however, been some trees planted, most of which died from neglect. Enterprising individuals have been planting trees along the public highway, some of which are looking fine. Many of the trees along the roadside have been ruined by that natural enemy—the telephone line man.

The first crop throughout the district has been in some sections extraordinary fine, but in the greater part it was a failure. Strawberries were fine. Raspberries and blackberries were cut short by dry weather. Grapes were fine, but am sorry to admit that on account of the catbird, the robins and the bees, we failed to get much fruit. While I admire the robin and love to see it around the place, I think they destroy more raspberries, cherries and grapes than the whole insect aggregation. But the law says thou shalt not kill.

Oh, yes, we have one of the live horticultural societies of the State—one that has for years stood at the head, and every citizen of Wayne County feels proud of the work being done by the Wayne County Horticultural Society. There may be other societies in the State that are doing as much good, but none with a history so full of grand achievements. You ask what in my opinion can be done to advance the interests and improve the conditions. I say, "Organize the grange, the farmers' clubs, horticultural societies, that will draw together the women for social enjoyment." The men, we all know, will be with them—have a general social and good time.

D. E. HOFFMAN.

Winchester, Ind.

REPORT FROM SEVENTH DISTRICT.

To the Indiana Horticultural Society, to Be Held at Indianapolis, Indiana, December 7 and 8, 1905:

This district includes the county of Marion. There seems to be a healthy advancement in horticultural interests in this district. Many new patches of ground were planted to berries the past year, ranging from the little patch of 200 vines in the farmer's garden (to have a supply for the table) to four and five acres for market. While there has been a few patches of raspberries, blackberries, gooseberries and currants planted, the acreage in strawberries has exceeded all others com-

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bined. The home-grown berries averaged about $1.50 per crate of 24 quarts. This includes raspberries, blackberries and strawberries. True, some fine berries sold as high as $3 per case, but a number of cases sold as low as $1 per case.

The reader of this report will see that by growing the best, having no more than you can care for properly, giving the needed attention to your plants and berries, you are assured of ample reward.

Farm orchards are woefully neglected. Many farms have not one-half fruit trees enough to keep the family supplied with fruit were the trees to do their best every year. There are many farms in Marion County that do not have enough small fruits on them to supply the table for two persons for thirty days, and many farmers who plant small fruits seem to think they have done well in planting and trust to Nature and Providence to do the rest. Nature does her part as best she can, and Providence only what the man can't do, and the farmer complains that small fruit don't pay.

There are but three commercial orchards in the district. These are fairly well cared for and are either giving fair returns or promising such in the near future. Land for such orchards is worth from $150 to $200 per acre.

A few farmers are taking a pride in public roads and are planting trees by the roadside. We think it no innovation in this report to say it would be a thing of beauty, pleasure and some profit for the farmers to plant fruit trees along all the roadsides in the county. These trees should be sprayed by the road supervisors and kept in good shape and they should draw from a fund created in each county for the purpose.

School grounds as a rule are in a sad plight, as little care as possible being taken to beautify them.

Public parks are receiving quite a good share of attention. Many thousands of dollars being spent for their improvement.

There is one horticultural society in the district—Marion County Agricultural and Horticultural Society. J. J. Milhous, Valley Mills, is president, and Stella Patton, 3432 E. Twenty-fifth street, Indianapolis, is secretary.

As to the remedy for defects, we can not suggest anything better than for those who have learned the good and right way to ever keep before his neighbors an example worthy to be followed.

J. J. MILHOUS.

Valley Mills.

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REPORT OF THE NINTH DISTRICT.

To the Indiana State Horticultural Society:

If this society should offer a premium to the district that was showing the greatest lack of interest, and the most total disregard and indifference to fruit growing, the Ninth District would take the prize.

This district being composed of territory that is so well adapted to general farming and stock raising no doubt accounts for a great deal of the indifference that is manifested in horticultural pursuits. Another thing that is keeping us in the background is the lack of knowledge in regard to the adaptability of our soil and climate for successful fruit growing, believing that the soil is of too loose a nature and containing too much organic matter, lacking the principal elements that should form a considerable part of a good fruit soil. This of course is a delusion. Our soil is well adapted to the most successful fruit culture. The small fruits are especially adapted to our deep, rich, black soil. No place in the State do they grow finer and better strawberries and raspberries than is grown in the black prairie soils of the Ninth District. However, the district is not all a black prairie loam. There is an abundant supply of the more solid soils—that is, well adapted to the tree fruits—and with the proper education along horticultural lines this district would be made one of the foremost fruit growing sections of the State. This, however, is lacking to a very great extent. The method of setting out and caring for orchards is of the rudest character. The trees are frequently set in the sod, and thus left to battle with the grass and all the farm animals. The trees seldom live over the first year, and then the nurseryman is blamed for the trouble.

In the last few years there has been quite a marked improvement in some localities in regard to beautifying the homes and the school grounds. Many homes are now surrounded with flowers and shrubs and the whole protected by a wind-break of evergreens and deciduous forest trees. Yet there are many unsightly places that could be made both beautiful and pleasant by a small expenditure of time and money.

The planting of groves for protection and commercial uses is beginning to receive some attention. The people are awakening to the fact that the reforesting of the country is an absolute necessity, and are converting many of the waste and unsightly places into places of beauty and profit. Many are setting groves of black locusts and catalpa in connection with their orchard plantings, which in time will show some beneficial results.

Potato growing is receiving considerable attention, and while as yet

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we are not growing as many per acre as they are in the more sandy soil of southern Michigan, the standard of quality is equal to the best northern grown stock, and when they are properly graded and carefully handled the dealers are giving the home-grown stock the preference.

There are certainly great possibilities in the future for the potato grower in the Ninth District. There are two factors that are chiefly in favor of the potato grower. First, the home demand is such that many times more could be sold than we now grow. Second, the tendency of the farmers to specialize is making of them buyers instead of competitors. The man that has given his time and attention to the more important (or what he considers more important) matters, has no time to give to the proper cultivation of the potato. His tools are usually inadequate for the purpose, his ideas not in conformity with the best methods of the work; these coupled with the abhorrence of doing anything out of the regular routine, makes him a poor hand in the family potato patch.

As yet spraying has received but very little attention, either for orchard fruits, potatoes or garden vegetables. However, some are giving this very important work quite a great deal of attention, with splendid results.

Gardening is receiving greater attention as the country grows older. The many factories scattered throughout the towns and cities of the district have created a good market for all kinds of garden vegetables, and while the garden truck has been of abnormal growth this season, and the supply unusually large, the demand has been such that but very little remained unsold.

I would not think this report complete without mentioning the fact that many of our birds that appeared at one time to be almost extinct have been noticed in great numbers in our midst in the last few years. The robin, gold finch, catbird, bluebird, redbird, blue jay, wren and a host of others that are of great worth to the fruit grower.

I believe that this noticeable return of the birds can be traced to the more stringent laws governing the bird family, and while we have very good laws for their protection I believe that we ought to demand that there be no open season for any bird that has the insect-eating habit.

Respectfully submitted,

J. M. SNODGRASS, Committee.

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REPORT FOR TENTH DISTRICT.

The northwestern part of the State, comprising the Tenth District, by its close proximity to Chicago, offers most excellent inducements for fruit culture, especially small fruits. While the Chicago market is more than supplied by an inferior quality of berries from western Michigan, I do not find that their berries affect the first-class retail trade of Chicago. I have been shipping berries to Chicago for the past ten years, and during all that time my strawberries have netted me $1.25 for 16-quart crates on an average the season through. There is lots of good land in most of the northwest counties that will produce a fine quality of strawberries if the right man has hold of it. To make a success of berry growing for the Chicago market a strictly fancy berry must be supplied. I find that there are thousands of Chicago people (and you find them in all towns and cities) that are willing to pay a good price for something extra nice. The berries must be large, clean and put on the market in an attractive manner. The grower must select his customers and then furnish them goods superior to the "stuff" put on South Water street. This can be done from any part of the Tenth District, as it is not more than three to five hours' ride to Chicago from any county in the district. Berries that can be sent direct to grocery keepers will bring a much higher price than when they have to go through the hands of a commission merchant. To the man that has the business ability and push there are good opportunities in our district to make fruit growing pay. We have the soil, location, and all it lacks is the man. I know from personal experience that an acre of strawberries properly planted, taken care of and rightly marketed will pay from $300 to $400, and raspberries, currants and gooseberries will pay large returns per acre.

We have a few good locations for orchards, but a large per cent. of the district is sandy and low marsh and black prairie, which I do not think is just the land for orchards. Plums and cherries do well, but not apples and pears. Orcharding in the past ten years in the Tenth has made some good improvements and is still doing so.

H. W. HENRY, Committee.

REPORT FOR TWELFTH DISTRICT.

To the Indiana Horticultural Society:

I beg leave to submit the following report:

The horticultural conditions in this district remain practically the same as last year. There is about the same amount of planting done each year, but only occasionally in a commercial way.

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The apple crop in this district was almost a complete failure. There were hundreds of farms in Lagrange County that did not produce a bushel, while on the same farms a year ago hundreds of bushels of apples went to waste for want of a market at remunerative prices. The heavy crop the two previous years and the extreme cold and rainy weather during the blooming period were the probable causes for the failure this year.

The small fruit crop on light sandy soils was probably one of the best ever known, but on heavier soils the wet weather of May and June injured the crop one-half or more.

The plum crop was variable, some varieties in some localities bearing heavily, while in others they were an entire failure. The cherry crop also was very light. But the peach crop was a remarkable one, both native and budded fruit were heavily loaded. The best crop in ten years.

Mr. H. M. Whitney, of Dekalb County, reports nearly all tree fruits a failure and feels somewhat discouraged in orcharding. He finds the business an interesting study, but says it takes a man with an iron will to withstand all the disappointments in the fruit business.

I received brief reports also from Mr. L. E. Ferguson, Van Buren Township, Lagrange County (postoffice White Pigeon, Mich.); Mrs. Charles McClue, Fremont, Steuben County, and Mr. Jerry Dutter, Angola, Steuben County, which I append entire.

J. C. GROSSMAN.

Wolcotville, Ind.

Van Buren Township, December 4.

Mr. Grossman:

Dear Sir—With reference to the horticultural conditions of Van Buren Township, I can not add very much of material interest to the report of a year ago. I think, however, an increased interest in fruits and in the polish of homes is very evident. New plantings of orchard trees and small fruits in many farms is noticeable. Holding the horticultural meeting in this corner of the county had a good influence. Those who do not raise fruit seem more willing to buy of those that have a surplus. It was very much of an off year for apples in this corner of the county, and the few bushels of surplus met with sale at a good price. I planted this year 310 peach, 25 apple, 24 pear and 12 prune, all of which made a fair start in growth.

Respectfully,

L. E. FERGUSON.

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Fremont, Steuben County, December 1st, 1905.

Mr. J. C. Grossman:

Dear Sir—Your letter of the 28th ultimo was received. Replying would say the conditions have not changed so far as I have observed in the last year.

There has been an improvement along the lines of horticulture in the last ten years in this county, but a horticultural society is needed to stimulate the business and give it proper direction, which would no doubt lead to more rapid advancement. The custom of naming farms is growing and is to be commended. It gives the farm an individuality, as it were. A man who names his farm is apt to take pride in it and to care for it and beautify it with fruit and flowers.

The interest in general farming here is such that farmers are loth to care for fruits or fruit trees without they can see an immediate profit in it. As to small fruit, few farmers will go to the trouble of raising strawberries for their own use, preferring to buy or go without, and they mostly go without. I have for many years raised strawberries, grapes, etc., for home use, and know the luxury of having plenty of these delicious fruits.

There was a great crop of peaches and plums in this county this year, but no apples to mention.

The farmers' institutes have been of great benefit along all lines of agriculture and horticulture—have led to better methods in both. Civic societies are a great benefit. The grange is helpful to the farmer where they are kept up. There is a farmers' club in this county called the "Alphas Club," consisting of twelve farmers, who meet at their homes once a month turn about, to discuss topics connected with the farm and to inspect the farm where they meet. One must be an up-to-date farmer to belong to that club.

This society is exclusive, but it is evident that such clubs stimulate the members to the very best that is in them.

Organization among farmers and fruit growers is needed to promote an interest and beget a genuine love for these noble vocations.

Yours truly,

CHARLES M'CLUE.

Angola, Steuben County, December 1, 1905.

Mr. J. C. Grossman:

Dear Sir—In reply to yours of the 28th, I have answered questions as brief as possible. Hoping it may assist you in your work.

Answer to Question No. 1.—No. Horticulture is on the decline owing to the higher prices in agricultural pursuits. There are a few in this lo-

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cality that are raising a few small fruits, but not more than is needed for home demand.

No. 2.—No. There are ten trees die where there is one set out, owing more to the lack of care than anything else. The reason is, they claim it does not pay. The trouble is, they do not understand how, and will not take advice from those that do know. I have one Northern Spy apple tree thirty-five years old that had thirty bushels on last year, that I got one dollar per barrel for, and the buyers picked and packed them themselves, furnishing their own barrels. This year the same tree bore twenty (20) bushels and they brought me one dollar a bushel, delivered here in Angola. This and other trees have not been cultivated for many years, but mulched and trimmed heavily every year like nature does for her trees in the forest.

No. 3.—I do not know of any large commercial apple orchards close around here. There are a few beginners here in the way of peach and plum. They have borne nicely for two or three years. Before these, there were but few in the country. The largest I know of is a Mr. Kinsey of Salem, this county, a Mr. Geedy and myself, postoffice Angola and Salem, Steuben County, Indiana. I think it very profitable business myself, or I would not follow it. I had two hundred peach trees, one-half eight and the other twelve years old, that yielded me five hundred (500) bushels of peaches that averaged $1 and upward per bushel. Elbertas, $1.25 per bushel; other fruits according. I am now making a specialty of strawberries. A suitable land can be purchased at from $50 to $100 per acre, owing to the distance from market and the location.

No. 4.—There is some talk of, but there has been but little done yet. These together with similar questions that you ask are what we discuss in our Alpha Farmer Club meetings once each month in the year.

No. 5.—The chairman's name is T. I. Ferris. Pleasant Lake, Steuben County; Mrs. Enola Smith, secretary, Ashley, Steuben County, Indiana.

No. 6.—Some more enterprising nature-loving people to keep the work moving, for when we are studying nature we are working with God and doing His bidding.

Yours truly,

JERRY DUTTER.

Angola, Ind.

REPORT OF THIRTEENTH DISTRICT.

The Thirteenth District is composed of the counties of St. Joseph, Elkhart, Marshall, Starke, Fulton, Pulaski and Kosciusko; bounded on the north by the State of Michigan. We are just outside of the peach belt, yet peaches grow here. We had a bountiful crop this year, but they are so uncertain that it is not a profitable industry.

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I think on the whole that interest in horticulture is advancing in this part of the State, especially in St. Joseph County. The reason of this is that we have one of the strongest local horticultural societies in the State. We have regular meetings and discuss matters that are of interest to the fruit grower, thereby profiting by one another's experience. We buy all our packages for packing fruit in carload lots direct from factory, in that way saving the middle man's profit.

Farms are better supplied with fruit than a few years ago. The average farmer is rather indifferent as to the care he gives it, but as long as he has enough for his own table he is satisfied, regardless of the quality. There is some new planting in a small way, but no large commercial orchards are being planted; in fact, there are none in the district. There is no forward movement in the adornment or improvement of school grounds, and I do not think there will be until the schools throughout the rural districts are consolidated, each township have but one school and that centrally located. We could then afford to employ a competent person to improve and beautify and care for them. Under present conditions I do not think it would be practicable.

In regard to roads, I believe we are keeping pace with the times, and on the whole there is a steady advancement.

C. W. FOOTE.

(This report was received too late for publication last year, but because of its merit it is inserted here.—Secretary.)

NINTH DISTRICT REPORT.

To the Indiana State Horticultural Society:

In making this annual report I regret that after taking some pains to learn of the conditions prevailing in this district, with some notable exceptions, I am compelled to say that the fruit industry is far from being that live, energetic, pushing part of our industrial life that characterizes many other branches of farm work. Farmers as a rule are neglecting the orchards that are out, and the new plantings are not as numerous as in former years. Small fruits are grown on most farms for family use, but are not well cared for nor planted in a systematic manner. Why this condition should prevail would be difficult to tell, except that the growing of tree fruits is attended with more uncertainty than in former years, when fungus and insect enemies were comparatively few. The average farmer has only a vague and limited knowledg of spraying, and has less inclination to do the work at the proper time. The tendency, if one may judge from general conditions, is to either make but few plantings about the farm buildings, giving the ordi-

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nary farm care and taking chances for fruit, or to make a specialty of fruit growing, as a money crop, fitting up with spraying outfits, insecticides, etc., and giving the business from start to finish special care. In Howard County, near Russiaville, where commercial small fruit growing a few years ago flourished, there is practically nothing doing in that line at this time. Low prices for fruit and disastrous seasons of excessive heat and drouth in summer, and excessive cold in winter have been the leading causes attributed to these changed conditions. Pear and apple blight have also been very disastrous to these fruits of recent years in this district.

The codling moth is also a standing menace to apple growing, as is the curculio to most of our best plums. Peaches are not grown with the expectation of anything like paying results. People plant them about their buildings, thinking that perhaps a crop one year in three to five would not be beyond a reasonable hope. The spraying of orchards and small fruits for insect enemies and fungus diseases is not practiced by the people at large as a means of protection from these enemies, but rather a "get all you can" with the least amount of effort policy is the one that seems to be in favor. Strawberries, raspberries, blackberries and grapes are comparatively free from disease and insect pests, when properly grown, and renewed by frequent plantings. Gooseberry and currants are easily grown by the use of white hellebore to prevent destruction of the bushes and fruit by the green currant worm.

Until fruit growing can be fixed upon some more systematic plan whereby it is taken out of the realm of a chance business, it would seem that all efforts to induce our people to grow fruits as a money crop would be futile. As it is now there is either such a flood of fruit that the price is ruinously low, or such a dearth of fruits that the price is almost prohibitory to the buyer.

As a remedy for this state of affairs, I would suggest that there be a systematic effort on the part of the State Horticulture Society to arouse general interest in fruit growing by working through the farm press, the farmers' institutes and kindred organizations.

The dissemination of literature giving instructions in growing the various fruits, how and when to spray them and the kinds suited to their locality would also be of great value. Such pamphlets to be kept on hands with our State Secretary and sent out upon application for same, and given out at the farmers' institutes during the winter season.

As proof of the assertion that apple growing in this section of our State can be made more than a matter of chance, I only need to refer to the fact that J. M. Zion, of Clark's Hill, Tippecanoe County, Indiana, received a gold medal and three additional medals for the superiority

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of his apples and other tree fruits at the Louisiana Purchase Exposition, held at St. Louis last year. Having made a personal visit and inspection of Mr. Zion's orchard, I desire to report that from his fifty-acre orchard, mostly set to standard varieties of apples, he assured me that no part of his farm, which consists of some three hundred or more acres of excellent corn and grain land, yielded him so great a profit as this fifty acres planted to orchard fruits. Land in this vicinity is worth $100 per acre. This orchard has a healthy, vigorous appearance and is situated on a south and east exposure, sloping gently southward, with a heavy piece of woodland on the north and west. Soil mostly black walnut and hickory, black soil forming the major part of the area. In this orchard there is planted some two thousand apple, five hundred pear, one hundred cherry and one hundred plum. Land is well underdrained with tile drains four to six feet deep, between every other row of trees. First plantings were made fourteen years ago, at which time peach trees were set between every row of apples and allowed to remain four years, Early and late Crawford, Wheatland Wonderful, Early Rivers and Elberta being the varieties used. Some fine crops of peaches were grown in this orchard in this way before apples came into bearing, clean cultivation being given throughout for the first five years. At this time about one-half of orchard is set in blue grass the other half kept clean as a matter of testing the better method as trees become older and in full bearing. The plantings in apple consist of Duchess, Yellow Transparent, Red Astrachan, Washington, Strawberry and Early Harvest for early. Fall varieties, Maiden Blush, Wolf River, Wealthy, Gideon and American Beauty. Winter varieties, Ben Davis, Stark, Northern Spy, Rome Beauty, Grimes Golden, Hubbardson, Baldwin and Rhode Island Greening.

Varieties of pear are mainly of Keiffer, Koonce, Duchess and Garber. Has experimented with a large number of varieties, but find these best suited to this section. His plantings of cherry are mostly of Early Richmond and large Montmorenci.

In plums he has Damson, Lombard, Little Peach, Shippers Pride and Burbank; Abundance and Wickson of the Japan varieties.

Mr. Zion considers the codling moth the greatest enemy to successful apple growing, which he combats with the Bordeaux and Paris green mixture, giving three sprayings, using a four hundred-gallon tank with Deming two-way sprayer, with hose and bamboo pole.

With cold storage, Mr. Zion is able to go into the holiday markets with his best fall varieties—Wolf River and other varieties—commanding the highest prices in the Indianapolis market, bringing as much as $5.00 to $7.00 per barrel, in competition with all other home-grown and imported stock.

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Dr. O. A. J. Morrison, of Middlefork, and Dr. J. S. McMurray, of Frankfort, Clinton County, are also growers of tree fruits for commercial purposes, each having successful orchards of cherry, pear and plum.

With intelligent guidance we believe that fruit growing in central Indiana can be made a most profitable adjunct to general farming, as well as a profitable and enjoyable business.

D. F. MAISH.

Frankfort, Ind.

SOIL CONDITIONS ESSENTIAL TO SUCCESSFUL POTATO GROWING.

W. J. RITTERSKAMP, PRINCETON, IND.

My experience with growing potatoes dates back to the past twelve years probably. During this period I have used the following soils for the crop: White clay, muck, peat soil, sand (yellow), clay loam, and a dark colored soil with a trace of sand in it found on the knolls surrounding our marshes in Southern Indiana. The one we have used most is a chocolate colored loam with a red brick clay subsoil. This soil is capable to produce large yields of most any farm and garden crops, but difficult to catch at just the right time to work to best advantage early in the spring when we prepare for planting potatoes. The peat, sand and dafk knoll soils work down fine without much labor and at most any time one may wish to work them. The clay loam must be taken when just right. If plowed and worked when wet it will be much injured and very difficult to get into a lively, pliable condition. This dead, unpromising state will likely last all season and a poor crop be the result. If one waits too long before plowing there will be great lumps to pulverize on the more clayey points.

The greater portion of our upland soils in the southern half of Indiana are of somewhat the nature above described.

An essential point to successful cropping of these clay loams is to thoroughly underdrain them, even though there be an ample surface drainage to carry off rain water. Our main garden has four-inch drain tile laid about every three rods and we find that it greatly improves the open, lively condition we like to see, and it helps warm the soil early in spring so we are enabled to work this land a week sooner probably than that not underdrained.

Potatoes will not thrive in a wet soil, and one that is subject to overflow is entirely unfit to plant to potatoes. Sometimes we may grow

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a large paying crop on such soils then find them all taken by rot should a wet spell occur.

We grow some late potatoes as a second crop after peas, strawberries, etc., but find that our climate is not well suited to the growing of potatoes during the heated season and only by planting extremely late, about July 1, can we expect to grow a fair crop. So our main planting is for early market and to have our crop sold before the market becomes filled and the price low we must plow and work our soil long before it is in proper condition.

For years I followed the teachings of such authorities as Mr. Terry, Agee and others to thoroughly fine our soil before planting. We have found it a mistake to work our soil into proper shape early in March. Mr. Terry and others I mentioned grow late potatoes, or at least plant near May 1st, and are teaching right for that time of year. But to drag, harrow and disk our soil into condition early in March, to be followed by packing rains in a few days, would leave a poor soil to produce a maximum crop.

The essentials for growing a maximum crop seem to lie largely in having our soil in the proper mechanical condition—loose and friable, some six or eight inches deep—during the growing season more than at the time of planting, therefore we often plant in rather rough soil, and later by deep cultivation and harrowing in the early stages of growth properly fit our fields.

Ideal conditions almost, so far as the soil is concerned, for growing potatoes are found in our reclaimed marshes, where the soil is composed of decaying vegetable matter, and were it not for the danger of excessive moisture in a wet season and overflows from heavy sudden rains one could wish for no better soil. The yield in favorable seasons is abundant, the tubers are clean, smooth, and have a bright surface as though they were waxed, and contrary to the general belief the quality is A No. 1.

The nearer we can approach, on our different soils intended for potatoes, conditions as they exist in the above named peat soils the better will be our yield, the better satisfied our customers and the more cheerful will we be as we work along in our crop at its different stages, especially at the time of digging.

Now, what do we find so favorable to the best development of potatoes in the peat soils? First, abundant soil moisture; next coolness, at least below the first two inches of surface; and third, a loose, open texture, admitting air and sunshine—the two elements essential to all favorable growth, either animal or vegetable.

Rain falling on such soil disappears at once, while the loose vegetable mold acts as a mulch, retaining the moisture admitting air and sunshine

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yet keeping cool that portion of the soil in which the roots are at work. How can we obtain such soil conditions on our clay loams, sands and intermediate mixtures? By first thoroughly underdraining to remove stagnant soil water and letting air occupy the spaces formerly occupied by this water. Next we must incorporate vegetable matter to make humus. We can do this by either plowing under green crops as clover, cowpeas, etc., or we may apply large quantities of barn manure, peat, straw, or other matter that will loosen the soil and change its mechanical condition. When soils are in this loose, friable condition it seems that plant foods are made available rapidly and very good yields of potatoes are obtained from such soils without the addition of any fertilizers, yet I would venture the assertion that when you have secured such a favorable seed bed there is nothing that will return more cash generally for the amount invested than the application of half a ton per acre of some reliable brand of complete fertilizer. If you should prefer to use barn manure in place, it is far better to apply it to some preceding crop, as stable manure in its raw state tends to develop or at least promote scab spores.

If a crop of clover has been plowed under within a year the fertilizer you apply need not be rich in nitrogen, but rather so in potash and phosphoric acid. We have used with satisfactory results a product made by a reduction plant at Vincennes. Dead animals are gathered up over the country, the fat is extracted and the dry pulp ground up and muriate or sulphate of potash added to make a complete manure. It analyzes about 2 per cent. ammonia, 4 per cent. potash and a total of about 14 per cent. phosphoric acid. The potash contents should be about 7 or 8 per cent., but since we haul hard wood ashes from a large sawmill at the rate of about 200 bushels per acre and try to cover all lands about every four years, we do not care for such a high per cent. of potash. We object to the use of fresh ashes direct to the potato crop, as it has the same tendency as manure. It may be that the corroding influence of the lye on the tender skin leaves openings for the scab pores to develop.

We apply the ashes with a manure spreader to get even distribution, usually on land to be set to strawberries, cabbages, tomatoes or sweet corn. As mentioned before, we plant in March and early April and sometimes in rather rough ground, but we cover with a hoe, getting loose soil over the seed pieces. Later we fill the uneven spaces in the furrow by harrowing just before and after the plants come up. I have often thought of what the late Peter Henderson once said, that he wished he could hitch a balloon to his plows and harrows early in spring, for the tramping of horses' feet was such a source of disappointment. As we have not advanced to this stage yet we can at least keep the horses from tramping

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on the rows. We must keep the soil loose over the seed pieces. We have several times plowed our land late, say in November, but found, unless plowed again in spring, that life was lacking in such soil. We thought that even lands plowed several weeks before planting with several dashing rains on them had lost much in this respect. Therefore we plow a strip, prepare and plant as soon as we can, then plow farther.

The essential points, boiled down, seem to be: A well drained, open porous soil plowed deep and supplied with a liberal amount of plant food should be stirred often during the growing season to admit an abundance of air and sunshine.

POTATO GROWING IN INDIANA.

BY J. G. KINGSBURY, OF INDIANA FARMER.

The subject assigned me by your program committee, I am pleased to say, has proven much more interesting and suggestive than I thought possible, when first proposed. I had frequently talked editorially of the potato and the importance of paying more attention to its cultivation, but had never before made the subject a matter of much study; and therefore had never thought there was very much for the Indiana farmer in the humble tuber. Now I feel safe in declaring that "there's millions in it," or might be, right here in this great corn State of ours.

From the best information I am able to secure, it appears that the 2,500,000 people of Indiana consume a yearly total of somewhere near 12,500,000 bushels of Irish potatoes, worth at retail, about $6,250,000, and that we import between 1,500,000 and 2,000,000 bushels, or from $750,000 to $1,000,000 worth. As Indiana exports millions of bushels of corn and wheat and vast quantities of beef, pork and other products, we do not see any good reason why she may not also export potatoes; at all events, she should produce all that her people consume. To do this would save to the farmers of the State the million or so dollars that we send to neighboring States. It is one purpose of this society to show how this may be done.

In looking over the statistical reports of our State and comparing them with those of New York, Michigan and other States, where potatoes are grown commercially, we have been gratified to note that Indiana compares well with them, in the average yield at least.

Here are some of the figures for last year:

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	Acres.	Bushels av. yield.	Total.
Maine	103,317	175	18,080,475
New York	428,986	70	30,029,020
Pennsylvania	253,797	90	22,841,729
Ohio	161,930	78	12,630,540
Michigan	241,836	67	16,203,012
Indiana	77,818	80	6,225,440
Illinois	149,147	75	11,186,025
Wisconsin	237,497	68	16,149,796
Minnesota	134,471	82	11,026,622
Iowa	166,012	80	13,280,960
Missouri	86,089	82	7,059,298
Nebraska	87,144	93	8,104,392

In this list of 12 of our best potato growing States five States give a yield of more than 80 bushels average per acre, which was Indiana's average, and five give less, Iowa's average being the same as ours. As to Maine, whose average, 175 bushels, is far above all the others, we presume her potato fields are many and small and are given special attention, besides the State has a larger rainfall than most. It is somewhat of a surprise to find that the great potato State Michigan has so small an average yield as 67 bushels, and that Wisconsin, almost equally famous for the crop gives almost as small an average, 68 bushels.

It seems from this showing therefore that our short acreage and small aggregate yield is due not to necessity but to lack of interest in the potato as a commercial crop. It is a case of "we don't have to." "We might grow them if we would, but growing corn is easier, and therefore corn shall be our money crop." It is much the same as cotton growing in the Southern States. They can grow their own corn there and might grow and sell it at a profit, but they do not do so, and prefer buying it from northern farmers, and depending on cotton alone as their money crop. We think it a mistaken policy for them, and possibly people of other States think the same of Hoosier farmers for sending north and east for our potatoes.

We have frequent reports of good, paying crops, in our State, like the following:

J. W. Bowiy, of Tipton County, in the Indiana Farmer of December 16, reports a yield of 700 bushels from four acres, an average of 175 bushels per acre.

Mr. J. M. Snodgrass, of Clinton County, a commercial grower, tells us that he averages 200 bushels per acre, and in a very valuable paper read

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before our State Horticultural Society, at its annual meeting recently, told in detail how he accomplished the result. His paper is published in full in the Farmer of December 23d.

Mr. W. P. Beckett, of Aurora, produced 250 bushels per acre, as he tells us in the same number. These figures do not equal those of a Mr. E. A. Rogers, of Brunswick, Me., who claims to have dug 15,000 bushels from 42 acres, being 357 bushels per acre; but they do right well for a State that makes no pretensions to being a potato growing State, and show how easily we might take rank in that line if we cared to do so.

It is interesting to note in our State reports the counties that excel in the yield of potatoes. We name them in order of their importance in this crop: First comes Allen with 270,870 bushels; next St. Joe with 243,940 bushels; then Lake with 213,350 bushels, and big Marion County with only 184,195 bushels; Dekalb with only 172,135 bushels; Elkhart. 161,575 bushels; Kosciusko, 149,690 bushels; Laporte, 126,820 bushels; Noble, 124,850 bushels; Lagrange, 111,325 bushels; Steuben, 110,125 bushels; Marshall, 107,635 bushels. All the other counties report less than 100,000 bushels. Here are some of them: Union 2,180 bushels on 37 acres; Scott 2,420 bushels on 99 acres; Rush only 7,000 bushels on 107 acres; Ohio 8,590 bushels on 260 acres; Orange 4,050 bushels on 81 acres, etc.

The average yield per acre of the State in 1903 was 68.42 bushels; acreage 77,153: total yield 5,278,511 bushels; in 1904 the average was 86 bushels; acreage 60,657; total yield 5,216,992 bushels, which is about two bushels for each man, woman and child; but we need 5 bushels for them for food alone, to say nothing of starch and other products.

My youngest son, 19 years old, is a student at Winona Agricultural School, and supposed, therefore, to be somewhat interested in such subjects as this. At the table a few days ago, we brought up the question: How many bushels of potatoes could be grown on an acre, if one pound were produced on every vine, the vines one foot apart in the row, and the rows being three and one-third feet apart; and asked him to go and weigh a pound of potatoes and bring them in. He brought in three medium sized tubers that weighed just one pound. We asked him if he thought three such potatoes could be grown on each vine a foot apart across the field. He promptly replied that more than that number could be grown easily; and this would be the reply that most people who know anything about the subject would make.

We told him to find how many pounds would be grown on 67 rows, each 200 feet long. A little figuring showed the answer to be 13,400 pounds, and dividing this sum by 60 pounds gave us 223 bushels, as the yield of an acre, with the data as stated. It is easy enough to get a big yield of potatoes on paper, and it is not an impossibility to get 200 bush-

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els an acre from the ground, if all conditions are right. But others will treat of that part of the subject.

One principal reason, no doubt, why we do not grow potatoes more generally as a field crop, is the labor of digging them, but the farm machinery inventors have so far perfected the potato digger that the job of digging has become an easy one, and is done with very little loss and damage. This branch of the subject also will no doubt be discussed by others. I only offer a single suggestion on the subject, namely, that the cost of a machine may be divided, in many cases, among several farmers, and thus made light upon each. With our improved machinery for planting, cultivating, spraying and digging, and fertilizers where they are needed, Indiana's potato crop ought to exceed 10,000,000 bushels annually.

SEED, PLANTING AND CULTIVATION.

W. A. BOWMAN, DALEVILLE, IND.

I fully agree with what has been said here today, that proper soil condition is the first essential to successful potato growing. Next in importance is the seed used. Vitality in the seed is of first importance, we want to use such seed as will send its sprout through the ground with vigor, showing good hustling qualities when it first appears above ground and ready to use to the full all the advantages that may be within reach.

Shall we use home-grown or seed from farther north? Our practice is to use for main crop home-grown seed, using the northern seed in the trial plats. We do this in order that we may know something of the parent plant.

Selection of Seed.—We make our first selection of seed for next year's crop while the vines are yet green, and we select that part of the field where the vines are the most vigorous, as the place to get next year's seed. We hunt for vigorous vines, because they are less liable to attacks from fungous diseases and blight. The tuber used as seed being a part of the root system of the vine, partakes largely of its vigor, or vitality. Our second selection is made from the tuber itself, using only such as conform to the type of potato we wish to grow. If we are growing Carmen, we want our seed to show clearly the Carmen type, discarding all seed that have a tendency to grow warts or excrescences on them.

Size.—We do not want to plant the extra large potatoes. First, because they are of abnormal growth, and we would rather use seed of normal appearance. Second, because of extra amount required to plant

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an acre, and we discard them for reasons of economy. We prefer to plant medium or even small potatoes and often for reasons of economy we discard even the medium sized ones and plant mostly those weighing from 3 to 6 ounces, or from henegg to duckegg size. However, there are two kinds of small potatoes. Those growing from vigorous vines may give good yields, while those from spindling vines are a disappointment unless highly fed by a rich soil under favoring climatic conditions. It could not be otherwise by nature's laws and is not otherwise in our farm experience. Too much emphasis can hardly be placed upon the distinction between the tuber of small size that has been produced by a vigorous vine and the tuber of same size produced by a weak vine. In the first instance we have a potato that partakes of the great vitality of the parent plant as evidenced by the strong branches and top it produces. It failed to attain large size because it belonged to one of the late sets of the plant, or because the plant was late and did not have time for full growth.

The tuber of the second instance is small because of the natural weakness of the vine. It is true that small tubers from spindling vines may not give a failure of crop when used for planting, for it is possible to have a soil so rich and fine that high feeding of the plants brings improvement of the stock. That is soil, climate and cultivation may prevent deterioration, and even bring improvement. Were it not for such possibilities in plant life, improvement of strains would be very much slower than it now is. Most of us are seeking net profit from our land, and few of us have any excess of fertility. Then as practical farmers we should see that vitality of seed is of prime importance.

A vigorous plant will make a fair yield in moderate soil, and a better yield as opportunity is given it through applications of plant food and through choice tillage.

Storage.—Storage should be such as will preserve this vitaliy. Pitting is a good plan. We store in bulk in the cellar, giving care to the ventilation. When warm weather begins to show in the spring we open the windows at night and close during the day, to keep the temperature of the cellar low for as long a time as possible. During last of March or early April we resort, placing in bushel crates those we wish for seed and they are ready to be carried out of the cellar when we can no longer hold the sprouting back in their present storage. This occurs about the last of April or first of May. The crates are then carried to a shed, preferably one which has all four sides open giving free access of light. The crates are stacked in single tiers in order that all tubers may have as much light as possible. They will then sprout only short stocky sprouts, and we would like to plant these potatoes without breaking off these short stocky

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sprouts. It is all the better if the entire potato turns green from the effect of the light. We do not use the corrosive sublimate treatment, because we have grown potatoes successfully without it, not being troubled so far with fungous diseases. Its use entails so much extra labor, and we are after the most for time and labor expended. However, we may at some future time find a necessity for using the treatment, and don't want to be understood as saying that its use is of no practical benefit.

Shall we plant whole tubers or one, two or more eye pieces? Our practice is owing to size of potato. Were we planting 8 to 16-oz. potatoes we instruct our cutters to cut to single eye where it can be done to get pieces of a size required for the even feeding of the planter, for all our planting is done with a twohorse planter. Some small potatoes are often planted whole, but we prefer the single-eye pieces. We want this cutting done only a day or two ahead of planter, or long enough for the ooze from the cut to crystallize on the cut surface. We do our cutting by hand. A certain ladies aid society seems to be anxious for the job, and we are just as anxious that they have it, so long as their work is as satisfactory as the past has been. The main objection to the machine cut is the liability to not get an eye in all the pieces, and we strive for an absolutely perfect stand of plants on our field, as much of the success of the crop depends thereon. One other word in regard to the shape of these pieces. If you will halve a potato cutting through on the plane of any one of its eyes, you will find a streak going from the surface of that eye to the center of the potato, of a little darker color than the adjoining flesh of the tuber, where it seems to be connected with all the other eyes of the same potato. And it seems to me that the dark streak must have something to do with the vigorousness with which the piece of potato sends its sprout upward into the sunlight. Anyhow here is room for someone to experiment and to discover the part that dark streak plays in the first growth of the potato and also in the development of the future growth from it.

In the meantime we are taking no risks, but instruct our cutters to see to it that each eye-piece is cut in such a shape as to include as much of this dark streak toward the center as possible.

Planting-Time, Early or Late.—As we have only indifferent success with the growing of early potatoes we grow mostly or almost altogether the late varieties. When we do attempt to grow early varieties on large areas we seek to so time the planting that in the growing the critical time of the growth may not come in the most droughty months of the year. If we were so situated that we could control moisture as they seem to be able to do where irrigation is practiced, we would then try to grow more of the early varieties. But climatic conditions and rainfall with us seem

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to favor the late varieties. We plant our late varieties, owing to season, from 25th of May to 10th or sometimes the 20th of June.

We have planted in rows 34 to 36 inches apart; 14 inches apart in row. We expect to plant next season, on the choice ground I spoke of, 12 inches in the row. We plant this way because it is easiest for us to cultivate by horse power, and all other machinery used is best adapted to this system of planting—

Three-foot rows, 12 inches apart in rows, will require 14,520 pieces of seed to the acre. In Belgium they plant in hills 14 inches square and harvest from 600 to 900 bushels per acre; but labor is all done by hand, no animal being taken on the plat after plowing has been done. But labor is cheap and soil conditions well looked after.

We plant to such depth that after the ridge left by the planter is leveled we have 2 to 2½ inches of soil above the seed piece. The roots of the plant start not from the seed piece but from the underground joints or nodes of stem. We want at least two of these nodes to form under ground for the new potatoes set on at each of these nodes, and we want plenty of opportunity for the new sets to form.

Cultivation depends on season and kind of soil. No set rule can be given as the cultivation necessary this year may not be the cultivation needed when in the rotation of crops the same field is again planted to potatoes. However, this rule is always available: Cultivate to kill weeds, to keep the soil loose about the plant, and to conserve moisture. With these three purposes in view and with good judgment and thought all the time for the best welfare of the plant you can not go far wrong in the matter of cultivation. Our practice is to plow deep close to the plant at least once and only once, if excessive rains do not come before the plant is large enough to well shade the ground 4 or 5 inches around the stem. Other cultivations are shallow, taking great care not to go too near the plant after the tubers begin to set on. At the final cultivation we aim to throw just enough earth to the plant as will prevent sunburn of potatoes that may have formed too near the surface.

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ANNUAL REPORT OF THE NOBLE COUNTY HORTICULTURAL SOCIETY.

During the past year this society has increased its membership 100. It now numbers 500 members. It has held meetings during the year at the home of George Kiser in February; at the home of Horace P. Tucker in April; at the home of Byron P. Gray in June; at the home of William Barhan in August; at the home of Ed Strater in October; at the home of Mrs. Susan, John E. and Ellen Pancake in December. It has enjoyed a prosperous year; its meetings were successful from a standpoint of attendance, interest and enthusiasm. Miss Sydney Farmer, the child impersonator of Auburn, gave several readings at our February and April meetings. At our June meeting Prof. Frank Crone, a teacher in the Philippine Islands, spoke on "Life in the Philippines." At our August meeting Mr. A. G. Burkhart of Tipton addressed the young people of our society, subject "The Hope of Our Country."

Good music is a feature of every meeting. Recitations and readings by the young people have gone on with increased interest this year.

We made an exhibit of fruits, vegetables and flowers at the Kendallville Fair and won sweepstake prize of $35. Early apples were a partial failure. Winter apples were almost a total failure. Other fruits were average crop.

Don K. Hitchcock cast the society's vote at the meeting of the Indiana State Board of Agriculture in January, and Edward Moorhouse represented the society at the summer meeting of the State society at Henryville in August. The society will on August 16 and 17, 1906, entertain the Indiana State Horticultural Society at the beautiful country home of George D. Gaby near Brimfield. We anticipate the largest attendance, and trust this will be the most successful horticulture meeting ever held in the State of Indiana.

The annual financial report for the year 1905 shows receipts, $436.47; expenditures, $368.28; leaves balance on hand, $68.19. Our annual report contains 56 pages and substantial cover. Two thousand copies are printed for free distribution, mainly within the county. The officers of last year were re-elected for 1906. They are: Jos. C. Kimmell, Ligonier, President; May C. Hitchcock, Brimfield, Vice-President; Jno. W. Moorhouse, Albion, Secretary; Wm. W. Cary, Albion, Treasurer; Executive Committee, George D. Gaby, Perry J. Stanley, C. L. W. Harvey.

JOHN W. MOORHOUSE, Secretary.

J. C. KIMMELL, President.

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FROM A "TREATISE ON THE PAWPAW."

BY JAMES A. LITTLE, CARTERSBURG, IND.

The pawpaw is indigenous to central Indiana, but is found growing in its natural state over a large area of country extending to the gulf on the south and as far west as eastern Kansas. It is found along most of the rivers and small streams. It delights in rich alluvial river bottom soil. It is well adapted to black ground and sugar tree land, but is also found growing on heavy clay land. In fact, any place where the soil is not too wet. The trees, or bushes, as they are generally called, grow to the height of from twenty to twenty-five feet, and commence bearing from four to six years after planting the seed. They bear when from four to six feet high. The pawpaw is remarkably hardy, never having been known to be affected by cold weather. There are a great many varieties. The large specimens generally grow singly or in pairs; the smaller ones set in clusters of six or eight. The fruit is generally oblong, but sometimes roundish in shape. Every variety of the pawpaw has its characteristic flavor, but all pawpaws are good if eaten when in a proper degree of ripeness. There is a general opinion that white fleshed pawpaws are not fit to eat, but that is a mistaken idea. They are the late ones that extend the season to early winter. They are not edible until they turn a blackish color and the skin toughens somewhat. They are frequently found hanging on the trees as late as Christmas, when their pulp is of the most delicious quality and as fine as Jersey butter. In central Indiana the pawpaw commences to ripen about the first of September, and the bulk of the crop is ripe by the last of September or first of October, and lasts until early winter. Before maturity the pawpaw is green, but changes to a yellow as it ripens, and later turns to dark brown. When fully matured the flesh of most pawpaws is yellow and has something of the appearance of custard; but occasionally white-meated varieties are found. The pawpaw contains from five to eight seeds, which are rather conical in form, flatish, about one inch in length, with a smooth surface and of a brown or chestnut color. Most people have an idea that it requires frost to ripen the pawpaw, but it is a mistake. Frequently the greater part of the pawpaws is gone before there is any frost. They ripen the same as peaches. A common sized pawpaw weighs about a half pound, but occasionally some will weigh three-fourths and sometimes a pound, which is the largest size. Pawpaws that grow in clusters are generally smaller in size.

The reason that the pawpaw is not generally found in the market is

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on account of its perishable nature. The fruit does not bear handling like the banana. They may be kept sometimes if picked a little firm, but are better in quality if allowed to hang on the tree until they drop to the ground. One of the characteristics of the pawpaw is that it always bears, yet there is an occasional season when there is only a light crop on account of late frosts, but it generally bears some, as it is a late bloomer. One redeeming feature of the pawpaw is that it has no insect or fungus enemies; consequently there is no need of spraying. Stock do not browse the bush in the pasture; not even sheep have any relish for it. So we have one fruit that is immune from the ravages of blight, insect and fungus troubles, and that means a great deal to the fruit grower. Pawpaw bushes are generally found in a state of nature growing in clumps. The trees throw up suckers, so that a clump of bushes is formed with the parent tree in the center of the group. The pawpaw is by nature an undergrowth. It seems to thrive best when found growing in woods that have been thinned out. Its natural situation is in virgin soil where the surface of the ground is covered with humus and dead leaves. Unlike any other fruit tree, the pawpaw is not retarded in growth or bearing on account of close planting. The largest and most luscious fruit is found in clumps of bushes that stand so close that a cow would be hidden among them. If you enter these clumps of trees in autumn you will find the ground strewn with the finest fruit and the limbs laden to the ground. Shade is no hindrance to the quantity or quality of the fruit.

One of the strangest things is that while the pawpaw is one of the richest of fruits in saccharine matter, hogs will not eat it. There are a few persons who do not relish the pawpaw, and they give as a reason that they do not eat things a hog won't eat. They consider that a stunner. Then I tell them that I don't eat everything that a hog eats. Chickens from some cause never touch them. Pawpaws may lie in piles on the ground and not be touched by a chicken. In fact, I do not remember of seeing any kind of a fowl eating the fruit, but opossums, coons, skunks and squirrels eat it with great relish. I am glad that hogs do not eat the pawpaw. I attribute it to a wise provision of Providence that they do not eat it. Often I have gone to the woods where great herds of swine were hunting in the woods for nuts, and wagon loads of the most delicious pawpaws were lying thick under the bushes. Whereas if the hogs had relished them I should have returned home with a sad heart and an empty stomach. If there is anything that ever grew below ground or above ground that is better than the pawpaw it is the custard apple, which is only the Yankee name for the pawpaw. It is sometimes called the Indiana banana.

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It is easy to understand why the pawpaw has not been cultivated. It is because it has always grown so plentiful in a state of nature that any one could go out to the woods pastures and get all they could carry home, so there was no need of cultivating the trees. Farmers formerly raised no objections to pawpaw hunters trespassing, but as the timber disappears and land is put under cultivation pawpaws are becoming scarce, and land owners are complaining because there is a demand for the fruit, and they say people had as well pilfer their apple orchards. The farmers object especially to hucksters gathering the fruit and taking it to market. Hence it is very evident that the pawpaw will receive attention and be brought under cultivation for home and market purposes. One reason why attempts have not been made to plant the trees is that there is a prevailing opinion that pawpaw trees can not be successfully transplanted. That impression has been formed by an effort to grow trees from suckers taken from the woods. It is a demonstrated fact that suckers are hard to make live from some unexplained reason, but if shaded the first season some will grow. Trees may be grown from seed and will transplant while small, but even they start slowly. I have had perhaps more experience in attempting to cultivate the pawpaw than any one else. I have made many failures, but I feel that I have at least succeeded in learning the art which was one of the hidden mysteries of nature. The pawpaw tree is by nature an undergrowth, and necessarily must be shaded when it first comes up. My plan, which has been entirely successful, is to make a hill like a watermelon hill and plant about five seeds two or three inches in the fall. In part for protection, but mainly for shading the plants when they come up, I place a barrel, with both heads out, over the hill and let it remain for a year or two. After that the barrel may be removed, and then the plants will bear the sun. It must not be expected that the plants will come up until harvest or later. The plants will not get more than two or three inches high the first year, but the root will be proportionately much larger than the top. The second year the plants will grow six or eight inches high, and after that they will greatly increase in growth from year to year. It will take them about six or eight years to come into bearing.

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IN MEMORIUM.

SNEAD THOMAS.

Snead Thomas, long a prominent and useful member of the Indiana Horticultural Society, died at Marion, Grant County, Indiana, after an illness of short duration, on Monday, November 6, 1905.

He was born in Grant County in 1846, where he lived all his life. As a boy he loved to work with fruits and vegetables, and at the age of 21 he chose farming as his occupation and engaged in market gardening and fruit growing, in which he excelled. His fruits and vegetables were always noted for their fine quality and their honest grading, and they commanded the highest prices and the best customers. He was a lover of children, and enjoyed their company. During berry time he employed many of them, who universally respected and loved him. He took an active part in the agricultural and horticultural affairs of his county, being a leader in this work. He was county chairman of the Farmers' Institute, and nearly always had a place on the program.

He became a member of the Indiana Horticultural Society in 1885, was elected to and filled with satisfaction several offices in the society, and at the time of his death represented the society in the Eleventh Congressional District as a member of the Committee on Horticulture.

DAVID H. GOBLE.

David H. Goble, a member of this society since 1890, died at his home in Greenfield, Indiana, September 30, 1905, aged 66 years.

He was born in Rush County, Indiana, in 1838 and removed to Greenfield in 187.., where he resided ever since.

While never a professional school teacher, he has done much for the advancement of the public schools. In 1881 he became connected with the Home and School Visitor, a juvenile magazine, used as a reading text supplement to the regular school readers. Afterward he became sole owner and manager of the magazine, and brought it to a high degree of efficiency and usefulness. Throughout this and adjoining States this magazine became a regular text-book on reading in the public schools, and did much to enliven and give life and interest to the practice of reading.

Although most of his life was devoted to this and similar work, he took great pleasure in the care and culture of fruits and flowers, and much of his leisure was spent in caring for these on his home grounds, where he had gathered many rare and beautiful plants.

On account of failing health he had not been able to attend the more recent meetings of this society. When present he took a deep interest in the proceedings and an active part in the discussions.

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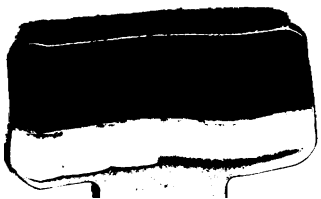

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